BACHELOR OF COMPUTER APPLICATION (BCA)
THREE YEAR FULL - TIME PROGRAMME

COURSE CURRICULUM

INSTITUTE OF MANAGEMENT STUDIES
ADHYATMIK NAGAR CAMPUS, GHAZIABD
(An ISO 9001:2000 Certified Institution)
NH-24, Adhyatmik Nagar, Dasna, Ghaziabad
National Capital Region of India

PHONES: 0120 – 7838382761-65
Email: director.uc@imsgzb.com URL: www.anc.ims–ghaziabad.ac.in
# COURSE CONTENT (w.e.f. August 2011)

## SEMESTER I

<table>
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### QUALIFYING PAPER

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CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT
THREE YEARS BACHELOR OF COMPUTER APPLICATION PROGRAMME

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, Cramer’s 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:
BCA-102  PROGRAMMING PRINCIPLE & ALGORITHM

Unit – I  Introduction to ‘C’ Language Fundamentals
History, Structures of ‘C’ Programming, Function as building blocks.
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
Console based I/O and related built in I/O function: printf(), scanf(), 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, \(^{n}C_{r}\), 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
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

<table>
<thead>
<tr>
<th>Unit</th>
<th>Introduction to Computers</th>
<th>Algorithm and Flowcharts</th>
<th>Operating System and Services in O.S.</th>
<th>Windows Operating Environment</th>
<th>Editors and Word Processors</th>
<th>Spreadsheets and Database packages</th>
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</table>

**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 Tennenbom Tata MacGrow Hill Publication
BCA-104  PRINCIPLE OF 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
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
8. Business organization and Management by Talloo by Tata McGraw Hill
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: 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 good listening.

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: 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 :
5) Business Communication - Dr.S.V.Kadvekar, Prin.Dr.C.N.Rawal and Prof.Ravindra Kothavade-Diamond Publications, Pune.
8) Modern Business Correspondence - L.Gartside - The English Language Book Society and Evans Ltd.

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
ENIRONMENTAL 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
- 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.
- 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).
BCA-201 Mathematics II

Unit – I Sets
Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications

Unit – II Relations and functions
Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Introduction of Trignometric, Logarithmic and Exponential Functions

Unit – III Partial order relations and lattices
Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub, Lattices & Algebric Systems, Principle of Duality, Basic Properties, Sublattices, Distributed & Complemented Lattics

Unit – IV Functions of several variables
Partial Differentiation, Change of Variables, Chain Rule, Extrema of Functions of 2 Variables, Euler's Theorem

Unit – V 3d coordinate geometry
3D Coordinate Geometry: Coordinates in Space, Direction Cosines, Angle Between Two Lines, Projection of Join of Two Points on a Plane, Equations of Plane, Straight Lines, Conditions for a line to lie on a plane, Conditions for Two Lines to be Coplanar, Shortest Distance Between Two Lines, Equations of Sphere, Tangent plane at a point on the sphere

Unit – VI Multiple integration
Double Integral in Cartesian and Polar Coordinates to find Area, Change of Order of Integration, Triple Integral to Find Volume of Simple Shapes in Cartesian Coordinates.

Referential Books:
BCA-202  C Programming

Unit – I  Arrays  Definition, declaration and initialization of one dimensional array; Accessing array elements; Displaying array elements; Sorting arrays; Arrays and function; Two-Dimensional array: Declaration and Initialization, Accessing and Displaying, Memory representation of array [Row Major, Column Major]; Multidimensional array

Unit – II  Pointers  Definition and declaration, Initialization; Indirection operator, address of operator; pointer arithmetic; dynamic memory allocation; arrays and pointers; function and pointers

Unit– II  Strings  Definition, declaration and initialization of strings; standard library function: strlen(), strcpy(), strcat(), strcmp(); Implementation without using standard library functions

Unit– IV  Structures  Definition and declaration; Variables initialization; Accessing fields and structure operations; Nested structures; Union: Definition and declaration; Differentiate between Union and structure

Unit – V  Introduction C Preprocessor Bitwise Operators  Definition of Preprocessor; Macro substitution directives; File inclusion directives; Conditional compilation Bitwise operators; Shift operators; Masks; Bit field

Unit – VI  File handling  Definition of Files, Opening modes of files; Standard function: fopen(), fclose(), feof(), fseek(), feof(); Using text files: fgetc(), fputc(), fscanf()  Command line arguments

Referential Books:
1. Let us C-Yashwant Kanetkar.
2. Programming in C-Balguruswamy
3. The C programming Lang., Person Ecl - Dennis Ritchie
4. Structured programming approach using C-Forouzah & Ceilberg Thomson learning publication
## BCA-203 Organization Behavior

### Unit – I: Fundamentals of Organizational Behaviour
- Nature, Scope, Definition and Goals of organizational Behaviour;
- Fundamental Concepts of Organizational Behaviour;
- Models of Organizational Behaviour;
- Emerging aspects of Organizational Behaviour: Meaning Cultural Diversity, Managing the Perception Process

### Unit – II: Perception, Attitude, Values and Motivation
- Concept, Nature, Process, Importance, Management
- Behavioural aspect of Perception. Effects of employee attitudes; Personal and Organizational Values; Job Satisfaction; Nature and Importance of Motivation; Achievement Motive; Theories of Work Motivation: Maslow’s Need Hierarchy Theory; McGregor’s Theory ‘X’ and Theory ‘Y’

### Unit – III: Personality
- Definition of Personality, Determinants of Personality;
- Theories of Personality- Trait and Type Theories, The Big Five Traites, Mytes-Briggs Indicator; Locus of Control, SType A and Type B Assessment of Personality

### Unit – IV: Work Stress
- Meaning and definition of Stress, Symptoms of Stress;
- Sources of Stress: Individual Level, Group Level, Organizational Level; Stressors, Extra Organizational Stressors; Effect of Stress - Burnouts;
- Stress Management - Individual Strategies, Organizational Strategies; Employee Counselling

### Unit – V: Group Behaviour and Leadership
- Nature of Group, Types of Groups; Nature and Characteristics of team; Team Building, Effective Teamwork; Nature of Leadership, Leadership Styles;
- Traits of Effective Leaders

### Unit – VI: Conflict in Organizations
- Nature of Conflict, Process of Conflict; Levels of Conflict - Intrapersonal, Interpersonal; Sources of Conflict; Effect of Conflict; Conflict Resolution, Meaning and types of Grievances & Process of Grievances Handling.

### Referential Books:
3. Organizational Behavior - By Fred Luthans
4. Organizational Behavior - By Super Robbins
5. Organizational Behavior - Anjali Ghanekar
7. Organizational Behavior through Indian Philosophy, By N.M.Mishra, Hikalaya Publication House
**BCA-204  Digital Electronics & Computer Organization**

**Unit – I** Logic gates and circuit  
Gates (OR, AND, NOR, NAND, XOR & XNOR); Demorgan’s laws; Boolean laws, Circuit designing techniques (SOP, POS, K-Map).

**Unit – II** Combinational Building Blocks  
Multiplexes; Decoder; Encoder; Adder and Subtractor.

**Unit – III** Memories  
ROMs, PROMs, EPROMs, RAMs, Hard Disk, Floppy Disk and CD-ROM

**Unit – IV** Sequential Building Blocks  
Flip-Flop (RS, D, JK, Master-slave & T flip-flops); Registers & Shift registers; Counters; Synchronous and Asynchronous Designing method

**Unit – V** Memory Organization  
Basic cell of static and dynamic RAM; Building large memories using chips; Associative memory; Cache memory organization and Virtual memory organization

**Referential Books:**
1. Digital Logic and Computer design (PHI) 1998 : M.M. Mano
3. Digital Electronics (TMH) 1998 : Malvino and Leach
BCA-205  **Financial Accounting & Management**

**Unit – I** : Overview - Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, Accounting standards in India


**Unit– III** : Financial statement analysis: Ratio analysis, Funds flow analysis, concepts, uses, Preparation of funds flow statement, simple problem, Cash flow analysis, Concepts, uses, preparation of cash flow statement, simple problem, Break - even analysis

**Unit– IV** : Definition nature and Objective of Financial Management, Long Term Sources of Finance, Introductory idea about capitalization, Capital Structure, Concept of Cost of Capital, introduction, importance, explicit & implicit cost, Measurement of cost of capital, cost of debt.


**Unit – VI** : Cash Management, Inventory Management and Receivables Management

**Referential Books:**

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BCA-206  **Computer Laboratory and Practical Work of C Programming**

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

BCA-302 Data Structure Using C & C++

Unit – I Introduction to Data Structure and its Characteristics Array
Representation of single and multidimensional arrays; Sparse 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:
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

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
BCA-304  Business Economics


Unit – II  Market Structure  Equilibrium of a firm and Price, Output Determination under Perfect Competition Monopoly, Monoplastic Competition & Oligopoly


Unit – IV  The World Economy

Referential Books:
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). \( ^nP_r = \frac{n!}{(n-r)!} \) (without proof). Combinations of ‘r’ objects taken from ‘n’ objects. \( ^nC_r = \frac{n!}{(r!(n-r)!)} \) (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:

3. Montogomery D.C. - Statistical Quality Control - John Welly and Sons
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
BCA-401 Computer Graphics & Multimedia Application


Unit – II Hardcopy Technologies, Display Technologies, Raster-Scan Display System, Video Controller, Random-Scan Display processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc, Clipping Southland- Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm


Unit – V Introductory Concepts: Multimedia Definition, CD-ROM and the multimedia highway, Computer Animation (Design, types of animation, using different functions)

Unit – VI Uses of Multimedia, Introduction to making multimedia - The stage of Project, hardware & software requirements to make good multimedia skills and Training opportunities in Multimedia Motivation for Multimedia usage

Referential Books:
BCA-402  Operating System


Unit– IV  Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap- Space Management, Disk Reliability


Referential Books:
BCA-403 Software Engineering

Unit – I Software Engineering: Definition and paradigms, A generic view of software are engineering.

Unit – II Requirements Analysis: Statement of system scope, isolation of top level processes and entities and their allocation to physical elements, refinement and review. Analyzing a problem, creating a software specification document, review for correctness, consistency, and completeness.

Unit– III Designing Software Solutions: Refining the software Specification; Application of fundamental design concept for data, architectural and procedural designs using software blue print methodology and object oriented design paradigm; Creating design document: Review of conformance to software requirements and quality.

Unit– IV Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style and review of correctness and readability.

Unit – V Software Maintenance: Maintenance as part of software evaluation, reasons for maintenance, types of maintenance (Perceptive, adoptive, corrective), designing for maintainability, techniques for maintenance.

Unit – VI Comprehensive examples using available software platforms/case tools, Configuration Management.

Referential Books:
BCA-404 Optimization Techniques

Unit – I Linear programming: Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation, Linear Programming Problem.

Unit – II Queuing Theory: Characteristics of queueing system, Classification of Queuing Model Single Channel Queuing Theory, Generalization of steady state M/M/1 queueing models(Model-I, Model-II).

Unit– III Replacement Theory: Replacement of item that deteriorates replacement of items that fail. Group replacement and individual replacement.

Unit– IV Inventory Theory: Cost involved in inventory problem - single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

UNIT-V Job Sequencing: Introduction, solution of sequencing problem Johnson s algorithm for n jobs through 2 machines.

Referential Books:
1. Gillet B.E. “Introduction to Operation Research”
2. Taha, H.A. “Operation Research - an introduction”
4. S.D. Sharma “Operation Research”
5. Hira & Gupta “Operation Research”
BCA-406  Mathematics III

Unit – I  **COMPLEX VARIABLES:** Complex Number System, Algebra of Complex Numbers, Polar Form, Powers and Roots, Functions of Complex Variables, Elementary Functions, Inverse Trigonometric Function.

Unit – II  **SEQUENCE, SERIES AND CONVERGENCE:** Sequence, Finite and Infinite Sequences, Monotonic Sequence, Bounded Sequence, Limit of a Sequence, Convergence of a Sequence, Series, Partial Sums, Convergent Series, Theorems on Convergence of Series (statement, alternating series, conditional convergent), Leibnitz Test, Limit Comparison Test, Ratio Test, Cauchy’s Root Test, Convergence of Binomial and Logarithmic Series, Raabe’s Test, Logarithmic Test, Cauchy's Integral Test (without proof)

Unit– III  **VECTOR CALCULUS:** Differentiation of Vectors, Scalar and Vector Fields, Gradient, Directional Derivatives, Divergence and Curl and their Physical Meaning.

Unit– IV  **FOURIER SERIES:** Periodic Functions, Fourier series, Fourier Series of Even and Odd Functions, Half Range Series.

Unit – V  **ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER:** Variable- Separable Method, Homogeneous Differential Equations, Exact Differential Equations, Linear Differential Equations, Bernoulli’s Differential Equations, Differential Equations of First Order and First Degree by Integrating Factor.


**Referential Books:**

**Course Code  Course Name**
BCA-405  Computer Laboratory and Practical Work of Computer Graphics & Multimedia Application

Practical will be based on Paper Computer Graphics & Multimedia Application: Covers UNIT-II, UNIT-III, UNIT-V of Syllabus
CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT
THREE YEARS BACHELOR OF COMPUTER APPLICATION PROGRAMME

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.


Referential Books:
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


Referential Books:
1. Patrick Naughton and Herbertz Schildt, “Java-2 The Complete Reference” 199, TMH.
3. Ivor Horton, “Beginning Java-2” SPD Publication
BCA-503  Computer Network


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

Referential Books:
BCA-504 Numerical Methods


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.


Referential Books:
1. Scarbourogh, “Numerical Analysis”.
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
BCA-601 Computer Network Security


Referential Books:
BCA-602  Information System: Analysis Design & Implementation

Unit – I  Overview of System Analysis and Design: Systems Development Life Cycle; concept and Models: requirements determination, logical design, physical design, test planning, implementation, planning and performance evaluation, communication, interviewing, presentation skills; group dynamics; risk and feasibility analysis; group based approaches, JAD, structures walkthroughs, and design and code reviews; prototyping; database design software quality metrics; application categories software package evaluation and acquisition.

Unit – II  Information Requirement Analysis: Process modeling with physical logical data flow diagrams, data modeling with logical entity relationship diagrams.

Unit– III  Developing a Proposal: Feasibility study and cost estimation. System Design: Design of input and control, design of output and control, file design/database design, process, user interface design, prototyping; software constructors; documentation.

Unit– IV  Application Development Methodologies and CASE tools: Information engineering structured system analysis and design, and object oriented methodologies for application development data modeling, process modeling, user interface design, and prototyping, use of computer aided software engineering (CASE) tools in the analysis design and implementation of information systems.

Unit – V  Design and Implementation on OO Platform: Object oriented analysis and design through object modeling technique, object modeling, dynamic modeling and functional object oriented design and object oriented programming systems for implementation, object oriented data bases.

Unit- VI  Managerial issues in Software Projects: Introduction to software markets; planning of software projects, size and cost estimates; project scheduling; measurement of software quality and productivity, ISO and capability maturity models for organizational growth.

Referential Books:


**Electronic Payment Systems:** Is SET a failure, Electronic Payments & Protocols, Security Schemes in Electronic payment systems, Electronic Credit card system on the Internet, Electronic Fund transfer and Debit cards on the Internet, Stored value Cards and E- Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Managerial Issues.

Unit – IV  **Public Policy: From Legal Issues to Privacy:** EC- Related Legal Incidents, Legal Incidents, Ethical & Other Public Policy Issues, Protecting Privacy, Protecting Intellectual Property, Free speech, Internet Indecency & Censorship, Taxation & Encryption Policies, Other Legal Issues: Contracts, Gambling & More, Consumer & Seller Protection in EC.

Unit – V  **Infrastructure For EC:** It takes more than Technology, A Network Of Networks, Internet Protocols, Web- Based client/ Server, Internet Security, selling on the web, Chatting on the Web, Multimedia delivery, Analyzing Web Visits, Managerial Issues.

**Referential Books:**
BCA-604 Knowledge Management

Unit – I Business Intelligence and Business Decisions: Modeling Decision Process; Decision support systems; Group decision support and Groupware Technologies.

Unit – II Executive Information and support Systems: Business Expert System and AI, OLTO & OLAP; Data Warehousing; Data Marts, Data Warehouse architecture; Tools for data warehousing.

Unit– III Multi- Dimensional analysis: Data mining and knowledge discovery; Data mining and Techniques; Data mining of Advance Databases.

Unit– IV Knowledge Management Systems: Concept and Structure KM systems, techniques of knowledge management appreciation & limitation.

Referential Books:

3. Han, Jiawei, Kamber, Michelinal, “ Data Mining Concepts & Techniques”, Harcourt India, 2001

BCA-605P Major Project

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

BCA-606P Presentation/Seminar based on Major Project

Presentation/Seminar based on Major Project will be evaluated by external examiner only.