COURSE STRUCTURE
YEARLY SCHEME OF EXAMINATION – BCA COURSE I YEAR

PAPER CODE	PAPER TITLE	EXAMINATION DURATION
BCA-101	Introduction To Information Technology	3 Hrs
BCA-102	Pc Software Packages	3 Hrs
BCA-103	Problem Solving Through 'C' Programming	3 Hrs
BCA-104	Basic Electronics	3 Hrs
BCA-105	Basic Mathematics	3 Hrs
BCA-106	Computer Organization	3 Hrs
BCA-107	Practical I : PC Software And Basic Electronics Lab.	3 Hrs
BCA-108	Practical II : C Programming Lab.	3 Hrs

YEARLY SCHEME OF EXAMINATION – BCA COURSE II YEAR

PAPER CODE	PAPER TITLE	EXAMINATION DURATION
BCA-201	Computer Communications And Networking	3 Hrs
BCA-202	Database Management Systems	3 Hrs
BCA-203	Fundamentals Of Operating Systems	3 Hrs
BCA 204	Data Structures Using 'C'	3 Hrs
BCA 205	System Analysis And Design	3 Hrs
BCA-206	Business Communications	3 Hrs
BCA-207	Practical I: Database Management & Data Structure Lab.	3 Hrs
BCA-208	Practical Ii: Business Communications Lab	3 Hrs

YEARLY SCHEME OF EXAMINATION – BCA COURSE III YEAR

PAPER CODE	PAPER TITLE	EXAMINATION DURATION
BCA-301	Object Oriented Programming Using C++	3 Hrs
BCA-302	Visual Application Development Using VB.Net 2010	3 Hrs
BCA-303	Linux Environment	3 Hrs
BCA-304	Management Information System	3 Hrs
BCA-305	Practical I : Visual Programming.	3 Hrs
BCA-306	Practical II : Linux.	3 Hrs
BCA-307	Project Report	3 Hrs

SYLLABUS BCA FIRST YEAR

Duration : 3Hrs.	BCA-101	Marks (Max. 70, Min. 21)

INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT-I

Computer Basics : Algorithms, A Simple Model of a Computer, Characteristics of Computers, Problem - solving Using Computers.

Data Representation : Representation of Characters in computers, Representation of Integers, Representation of Fractions, Hexadecimal Representation of Numbers, Decimal to Binary Conversion, Error-detecting codes.

Input & Output Devices : Description of Computer Input Units, Other Input Methods, Computer Output Units (Printers, Plotters)

UNIT-II

Computer Memory : Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to Construct Memories, Magnetic Hard Disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives.

Processor: Structure of Instructions, Description of a Processor, Machine Language and Instruction set. Processors used in desktops and lap tops. Specification of a desktop and Lap top computer currently available in the market (Specifications of processor, motherboard &chipset, memory, interface & capacity of hard disk & DVD drives, I/O ports)

UNIT-III

Computer Architecture : Interconnection of Units, Processor to Memory communication, I/O to Processor Communication, Interrupt Structures, Multiprogramming, Processor Features, Reduced Instruction, Set Computers (RISC), Virtual Memory.

Software Concepts : Types of Software, Programming Languages, Software (Its Nature & Qualities), Programming Languages.

UNIT-IV

Operating Systems : History and Evolution. Main functions of OS Multitasking, Multiprocessing, Time Sharing, Real Time OS with Examples

Database Management System : Purpose and Organization of Database, Introduction to Data Models

Computer Generation & Classifications: First Generation of Computers, The Second Generation, The Third Generation, The Fourth Generation, The Fifth Generation, Moore's Law, Classification of computers, Distributed Computer System, parallel computers.

UNIT- V

Computers & Communications: Introduction to Computer Communications, Introduction to Computer Networks, Types of Networks, OSI/TCP Model, LAN technologies (fast Ethernet &Gigabit Ethernet), How LAN works, Brief survey of active and passive LAN components.

Internet: Network, Client and Servers, Host & Terminals, TCP /IP, World Wide Web, Hypertext, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Case Study, Intranet.

Cyber Laws: Introduction to Cyber Laws **,** Cyber crime, Cyber contract, Cyber privacy, ITAct

Recommended Books:
1. P .K. Sinha, Fundamentals of Computers, BPB Publications
1. V. Rajaraman, Fundamentals of Computers, 3rd Edition, PHI Publications

SYLLABUS BCA FIRST YEAR

Duration : 3Hrs.	BCA-102	Marks (Max. 70, Min. 21)

PC SOFTWARE

UNIT-I
DOS: Introduction, history & versions of DOS, DOS basics- Physical structure of disk, drive name, FAT, file & directory structure and naming rules, booting process, DOS system files, DOS commands- internal & external,

UNIT-II
Windows Operating System : Windows concepts, Features, Windows Structure, Desktop, Taskbar, Start Menu, My Computer, Recycle Bin, Windows Accessories-Calculator, Notepad, Paint, Wordpad, Character Map, Windows Explorer, Entertainment, Managing Hardware & Software- Installation of Hardware & Software,Using Scanner, System Tools, Communication, and Sharing Information between programs.

UNIT-III
Word Processing; MS-Word: Features, Creating, Saving and Opening Documents in Word, Interface, Toolbars, Ruler, Menus, Keyboard Shortcut, Editing, Previewing, Printing, & Formatting a Document, Advanced Features of MS Word, Find & Replace, Using Thesaurus, Using Auto- Multiple Functions, Mail Merge, Handling Graphics, Tables & Charts, Converting a word document into varipus formats like- Text, Rich Text format, Word perfect, HTML etc.

UNIT-IV
Worksheet- MS-Excel: Worksheet basics, creating worksheet, entering into worksheet, heading information, data, text, dates, alphanumeric values, saving & quitting worksheet, Opening and moving around in an existing worksheet, Toolbars and Menus, Keyboard shortcuts, Working with single and multiple workbook, working with formulae & cell referencing, Auto sum, Coping formulae, Absolute & relative addressing, Worksheet with ranges, formatting of worksheet, Previewing & Printing worksheet, Graphs and charts, Database, Creating and Using macros, Multiple worksheets- concepts, creating and using.

UNIT-V
Introduction to Power Point: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect. '

Other packages: DTP software: Brief survey of MS Publisher, Pagemaker, Coreldraw, Adobe Photoshop

Recommended Books:
1. PC Software for Windows ? R.K. Taxali
2. Unix Concepts and Applications ? Sumitabha Das.

SYLLABUS BCA FIRST YEAR

Duration : 3Hrs.	BCA-103	Marks (Max. 70, Min. 21)

PROBLEM SOLVING THROUGH 'C' PROGRAMMING

UNIT-I

Algorithm & Algorithm Development : Definition and properties of algorithm, flow chart symbols, conversion of flow chart to language, example of simple algorithms, Introduction to program design, errors – syntax error, runtime error, logic error.

UNIT-II

Basics of C – Language : History, Constants – Integer, Real, Character; Variables and Keywords; Data types and size, constants, arrays, pointers, Operators – arithmetic, relational, logical, increment and decrement, bitwise and assignment, Hierarchy of Operators and Operations, Associatively of Operators, creation and evaluation of expressions.

UNIT-III

Control Structure : Decision Structure: - Simple if, if – else, if – else – if, nested if, switch case; Loop Control Structure:- while, do while and for; Use of break, goto and continue;

UNIT-IV

Functions : Function definition, declaration and prototypes, Call by Value and Call by Reference, Scope Rule of Functions.

UNIT-V

Complex C-Language : Variables – external, static, register; Recursive functions; multi – dimensional arrays; Pointers and arrays, pointer arrays, Structures – declaring and accessing elements, array of structure, File Input/Output – Create, Open, Read, Write, Delete, Close;

Recommended Books:
1. Yashavant Kanetkar, Let us C
2. Balaguruswamy, Programming in C

SYLLABUS BCA FIRST YEAR

Duration : 3Hrs.	BCA-104	Marks (Max. 70, Min. 21)

BASIC ELECTRONICS

1. **Semi Conductor Physics :** Properties of Semiconductors, Commonly used Semiconductors, Intrinsic Extrinsic semi conductors, P Type & N Type semiconductors, PN Junction & Biasing..

2. **Semiconductor Diode :** Diode, symbol, ratings, forward & reverse bias characteristics. Half wave rectifier, full wave rectifier, bridge rectifier, and simple filter circuits Zener diode & its application

3. **Transistor (Introductory concepts) :** PNP & NPN Transistor, CB, CC, CE configurations & biasing, Transistor as an Amplifier, Transistor as a switch, Alpha & Beta parameters, Frequency response & bandwidth, RC coupled Trasistor Amplifier & Transformer coupled transistor amplifier – their circuit diagram, Audio power amplifier, Push Pull amplifier. Principle of negative feedback in Amplifier & Gain, Transistor tuned amplifier Circuit, Oscillate Circuits, Crystal Oscillator, Different type of signals: Sine Ware, Saw Tooth, Triangular, Pulses, Multi vibrators.

4. **LED,** Photo Diode, Photo Transistor, Thermistor, LDR, BCR, Triode, their Characteristics & Applications.

5. **FET,** MOSFET & Construction, Symbol & Basic Circuits, their Advantage over Transistor.

Reference Books:
1. J Millman & C.C. Halkias - Integrated Electornics; Tata Mc-Graw Hill. Pearson education.
2. Rebert Boylestad & L. Nashelsky - Electronic Devices and Circuit Theory.
3. Sedra Smith-Micro Electronic Circuits. Oxford Press, India.

SYLLABUS BCA FIRST YEAR

Duration : 3Hrs.	BCA-105	Marks (Max. 70, Min. 21)

BASIC MATHEMATICS

UNIT-I

Evaluating Algebraic Expressions : Order of operations Evaluating algebraic expressions.
Linear Equations : Translating algebraic expressions combining like terms Solving linear equations :Addition property Solving linear equations: Multiplication property combining rulesLiteral equations solving linear inequalities.
Graphing Linear Equations : Linear equations in two variables The Cartesian coordinate system the graph of a linear equation Slope Point-slope form of a line Graphing linear inequalities

UNIT-II

Systems of Linear Equations : Systems of equations in two variables (addition/elimination)
Operations with polynomials : Positive integer exponents, Zero and negative integer exponents, Definition
of polynomials, Addition and subtraction of polynomials, multiplying polynomials
Factoring polynomials : Introduction to factoring, Difference of squares, Quadratic trinomials, Solving
equations by factoring, some word problems involving quadratic, equations

UNIT-III

Radical expressions and complex numbers : Introduction to roots and radicals, simplifying radical expressions [No variables] Operations with radical expressions [No rationalizing binomials], Complex Number [i Notetion only, No operations]
Quadratic equations and some conics : Special methods, completing the square, the quadratic formula, Parabolas [Graph by table]

UNIT-IV

SETS: Sets, subsets, equal sets, null set, universal set, finite & infinite sets, open & closed sets etc., operations on sets, partition of sets, cartesian product.
DIFFERENTIATION: Derivative, derivatives of sum, differences, product & quotients, chain rule, derivatives of composite functions.

UNIT-V

INTEGRATION Integral as limit of a sum, indefinite & definite integrals, methods of integration substitution, by parts, partial fractions, integration of algebraic and transcedental functions.
PLANE CURVES & POLAR COORDINATES : Polar coordinates, curve tracing in polar coordinates, area in polar coordinates, Arc length, area & volume of surface of revolution in Cartesian and polar coordinates.

Recommended Books:
1. C. L. Liu.: Elements of Discrete Mathematics, Tata Mac-Graw Hill.
 Thomas, G.B. and R. L. Finney: Calculus & Analytical Geometry, Addison-Wesley, 9th edition.
 Chandrika Prasad: Mathematics for Engineers, Prasad Mudranalaya, Allahabad, 19th edition 2. Shanti Narayan: Differential Calculus, S.Chand & Co.
3. Shanti Narayan: Integral Calculus, S.Chand & Co.

SYLLABUS BCA FIRST YEAR

Duration : 3Hrs.	BCA-106	Marks (Max. 70, Min. 21)

COMPUTER ORGANIZATION

UNIT-I

Overview of electronics :
Electronic components – Register, Capacitor and Inductors, Semiconductor devices – Diodes, Transistors (BJT and FET) . Analog vs Digital electronics, Transistor as a switch. Integrated circuits, SSI, MSI, LSI, and VLSI circuits. Multivibrators – astable, bistable, monostable, counters ripple and decade, edge and level triggering.

UNIT-II

Building blocks of computer system :
Basic building blocks – I/O, Memory, ALU and its components, Control Unit and its functions, Instruction – word, Instruction and Execution cycle, branch, skip, jump and shift instruction, Operation of control registers; Controlling of arithmetic operations;

UNIT-III

Addressing techniques and registers :
Addressing techniques – Direct, Indirect, Immediate, Relative, Indexed addressing and paging. Registers – Indexed, General purpose, Special purpose, overflow, carry, shift, scratch, Memory Buffer register; accumulators; stack pointers; floating point; status information and buffer registers.

UNIT-IV

Memory : Main memory, RAM, static and dynamic, ROM, EPROM, EEPROM, EAROM, Cache and Virtual memory.

UNIT- V

Interconnecting System Components : Buses, Interfacing buses, Bus formats – address, data and control, Interfacing keyboard, display, auxiliary storage devices and printers. I/O cards in personal computers. Introduction to Microprocessors and Microcontrollers: introduction to 8085 micropocesor, examples of few instructions to understand addressing techniques. Difference between microprocessor and microcontrollers.

Recommended Books
1. Andrew S. Tanenbaum, Structured Computer Organization, Printice Hall.
2. William Stallings, Computer Organization and Architecture, Sixth Edition, Pearson .

SYLLABUS BCA FIRST YEAR

`Duration : 3Hrs.	BCA-107 & 108	Marks (Max. 100, Min. 35)

PRACTICAL I: PC SOFTWARE LAB.

Experiments based on papers BCA 102.

PRACTICAL II: C PROGRAMMING LAB.

Experiments based on paper BCA 103.

SYLLABUS BCA SECOND YEAR

Duration : 3Hrs.	BCA-201	Marks (Max. 70, Min. 21)

COMPUTER COMMUNICATIONS AND NETWORKS

UNIT-I

Protocol Architecture : Overview: Communication model, Communication Tasks, Data Communication Networking: WAN, LAN, Wireless Networks. Basics of Network Software: Protocol and protocol architecture, Protocol functions, Design Issues for the layers, interfaces &Services, Connection oriented and connectionless services, service primitives, relationship of services to protocols, ISO REF Models, TCP/IP Model.

Data Communications: Data Transmission: Concepts of Frequency, Spectrum, bandwidth, Electromagnetic spectrum and frequencies for data communication, Fourier

analysis, Data and signal, Transmission impairments, channel capacity, Nyquist bandwidth, Shannon capacity formula, decibels and signal strength, Trans - mission media: Coaxial, twisted pair, Comparative study of Categories of cables, Coaxial, Optical Fibers, Wireless transmission: Terrestial Microwave, satellite, Broadcast Radio, Infrared.

UNIT-II

Data Encoding: (Brief idea of NRZ, Bipolar AMI, B8ZS, HDB3, ASK, FSK, PSK, PCM, AM, FM, PM), Spread Spectrum. Asynchrous and Synchronous transmission, Full and Half duplex, Interfacing, Functional and Procedural aspects of V.24, Data Link Control: Flow control: Stop and Wait, Sliding window, Error detection: Parity Check, CRC. Error control: Stop and Wait ARQ, Go back-N ARQ, Selective- Reject ARQ, Brief idea of HDLC and other Data Link control protocols

UNIT-III

Circuit Switching: Simple switching Network, Circuit Switching Networks, Brief idea of following (detail working) not required: Circuit Switching Concepts: Space Division switching, Time Division Multiplexing, Routing in circuit switching Networks, Control Signalling, Inchannel & common channel signaling, Brief idea of SS7. Packet Switching: Packet switching principles, Routing, X.25

UNIT-IV

LAN Technology: LAN architecture, IEEE 802 standards, Ethernet (CSMA/CD): Medium Access Control, 10Mbps, 100Mbps, Gigabit Ethernet. Brief survey of other LAN systems (Token ring, FDDI, ATM, Fiber channel). Wireless LANS, Bridges, Latest trends in LAN technologies LAN Devices: Study of specifications of L2 and L3 switches, Structured cabling, Passive components.

UNIT-V

Principles of Internetworking, connection less Internetworking, IP, IPv6, IP multicasting. Routing protocols, TCP, UDP, SNMP, SMTP and MIME, HTTP.

Recommended Books :
1. William Stallings: Data & Communications, Sixth Edition
2. A. S. Tanenbaum : Computer Networks.

SYLLABUS BCA SECOND YEAR

Duration : 3Hrs.	BCA-202	Marks (Max. 70, Min. 21)

DATABASE MANAGEMENT SYSTEM

UNIT-I

Introduction : Purpose of the data base system, data abstraction, data model, data independence, datadefinition language, data manipulation language, data base administrator, data base users, overall structure.

ER Model : entities, mapping constrains, keys, E-R diagram, reduction E-R diagrams to tables, generation,aggregation, design of an E-R database scheme.

UNIT-II

Relational Model : The catalog, base tables and views. Relational Data Objects - Domains and Relations: Domains, relations, kinds of relations, relations and predicates, relational databases.

Relational Data Integrity - Candidate keys and related matters: Candidate keys. Primary and alternate keys. Foreign keys, foreign key rules, nulls. Candidate keys and nulls, foreign key and nulls.

UNIT-III

The SQL Language : Data definition, retrieval and update operations. Table expressionsconditional expressions, embedded SQL.
Views : Introduction, what are views for, data definition, data manipulation, SQL support.

UNIT-IV

Network model : basic concepts, data structure diagrams, DBTG CODASYL model, DBTG data retrival facility, DBTG update facility, DBTG set processing facility, mapping networks to file, networks system.

Hierarchical model : basic concepts, tree structure diagrams, data retrieval facility, update facility, virtual records, maping hierarchical to files, hierarchical system.

UNIT-V

File and system structure : overall system structure, file organisation, logical and physical file organization, sequential and random, hierarchical, inverted, nullist, indexing and hashing, B-tree index files.

Recommended Books :
1. Date C.J., Database Systems, Addision Wesley.
2. Korth, Database Systems Concepts, McGraw Hill.

SYLLABUS BCA SECOND YEAR

FUNDAMENTALS OF OPERATING SYSTEMS

UNIT-I

Introduction: What is an operating system? Mainframe, desktop, multiprocessor, distributed, clustered,realtime and handheld systems.

Operating System Structures: System components, operating system services, system calls, systemsprograms, system structure, virtual machines.

UNIT-II

Process: Process concept, process scheduling, operations on processes, cooperating processes. Inter process communication.

CPU Scheduling: Basic concepts, scheduling criteria, scheduling algorithms, algorithm evaluation.

UNIT-III

Process Synchronization: The critical section problem, semaphores, classical problems of synchronization.

Deadlocks: Deadlock characterization, methods for handling deadlocks. Deadlock prevention, avoidance and detection. Recovery from deadlocks.

UNIT-IV

Memory Management: Swapping, contiguous memory allocation, paging, segmentation, segmentation with paging.

Virtual Memory: Demand paging, page replacement, allocation of frames, thrasing.

UNIT-V

Linux: History, design principles, kernel modules, process management, scheduling, memory management, file systems, input and output, inter process communication, network structure, security.

Recommended Books:

1. Silberschatz G.G., Operating System Concepts, John Wiley & Sons Inc.

SYLLABUS BCA SECOND YEAR

Duration : 3Hrs.	BCA-204	Marks (Max. 70, Min. 21)

DATA STRUCTURES USING 'C'

UNIT-I

Linear Structure: Arrays, records, stack, operation on stack, implementation of stack as an array, queue, operations on queue, implementation of queue.

UNIT-II

Linked Structure : List representation, operations on linked list - get node and free node operation, implementing the list operation, inserting into an ordered linked list, deleting, circular linked list, doubly linked list.

UNIT-III

Tree Structure : Binary search tree, inserting, deleting and searching into binary search tree, implementing the insert, search and delete algorithms, tree traversals

UNIT-IV

Graph Structure : Graph representation – Adjacency matrix, adjacency list, adjacency multilist representation. Orthogonal representation of graph . Graph traversals - bfs and dfs. Shortest path, all pairs of shortest paths, transitive closure, reflexive transitive closure.

UNIT-V

Searching and sorting : Searching - sequential searching, binary searching, hashing. Sorting – selection sort, bubble sort, quick sort, heap sort, merge sort, and insertion sort, efficiency considerations.

Recommended Books :

1. Horowitz E Sartaj Sahni, Fundamentals of Data Structure, Galgotia Publication Private Limited., New Delhi.

SYLLABUS BCA SECOND YEAR

Duration : 3Hrs.	BCA-205	Marks (Max. 70, Min. 21)

SYSTEM ANALYSIS AND DESIGN

UNIT-I

Introduction : System Concept and the need for system approach, Definition of system and system analysis, Factoring into subsystems, Black box system, Introduction to the basic elements of the system, Different types and behaviour of the system.

UNIT-II

The System Development Life Cycle and System Analyst : Source and inspiration of a new system development, Recognition and need, Linear approach and prototype approach, Different phases in SDLC, Role of System Analyst.

UNIT-III

System Analysis: Importance of planning and control, Information Gathering: Various Methods, Tools of Structured Analysis: DFD, Decision Tree, Structured English, Decision Tables, Data Dictionary, Feasibility study. System Design: The Process of Design: Logical and Physical design, Methodologies: Structured, Form- Driven, IPO Charts etc., Input Output Form Design, File Organization: Sequential Indexed, inverted list, Database Design, Logical and Physical View of Data.

UNIT-IV

System Implementation : Need of Testing, Test Plan, Quality Assurance, Trends in Testing, Audit Trail, Post Implementation Review, Project Scheduling, Selection of Hardware and Software

UNIT-V

Security and Recovery in System Development : System Security: Definition, Threats to system security, Control measures, Disaster/ Recovery Planning, Ethics in System Development. Case Study.

Recommended books:

1. System Analysis and Design - E.M.Awad
2. System Analysis and Design - Dennis Wixom

SYLLABUS BCA SECOND YEAR

Duration : 3Hrs.	BCA-206	Marks (Max. 70, Min. 21)

BUSINESS COMMUNICATIONS

UNIT-I

Concepts and Fundamentals : Meaning of communication, Importance of communication, Communication scope, Process of communication, Communication models and theories, Essentials of good communication - The seven Cs of communication, Factors responsible for growing importance of communication, Channels of communication, Verbal and Non-Verbal communication Formal and Informal communication Barriers of communication.

UNIT-II

Written Communication : Objectives of written Communication, Media of written communication, Merits and demerits of written communication, Planning business messages.

Writing Letters : Business letters, Office memorandum, Good news and bad news letters, Persuasive letters, Sales letters, Letter styles/ layout.

UNIT-III

Report Writing : Meaning & Definition, Types of report (Business report & Academic report), Format of report, Drafting the report, Layout of the report, Essential requirement of good report writing.

Language Skills : I mproving command in English, Choice of words, Common roblems with verbs, adjectives, adverbs, pronouns, conjunctions, punctuation, prefix, suffix etc.

UNIT-IV

Oral Communication : Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication. Interviews : Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guide lines for interviewee.

Arts of Listening : Good listening for improved communications, Art of listening, Meaning, nature and importance of listening, Principles of good listening, Barriers in listening.

Meetings : Definition, Kind of meetings, Advantages and disadvantages of meetings/ committees, Planning and organisation of meetings.

UNIT-V

Job Application : Types of application, Form & Content of an application, Drafting the application, Preparation of resume.

Project Presentations : Advantages & Disadvantages, Executive Summary, Charts, Distribution of time (presentation, questions & answers, summing up), Visual presentation, Guidelines for using visual aids, Electronic media (power-point presentation).

Business Negotiation : Definition of negotiation, Factors that can influence negotiation, What skills do we need to negotiate, Negotiation process (preparation, proposals, discussions, bargaining, agreement, implementation).

Recommended Books :
1. Communication by C.S. Rayudu, Himalaya Publishing House.
2. Communication Today - Understanding Creative Skill by Reuben Ray, Himalaya Publishing House.
3. Successful Communication by Malra Treece.
4. Business Communication Today by Bovee & Thill, McGraw Hill.
5. Principles of Business Communication by Murphy and Hilderbrandth.
6. Effective Communication Skiils by O. N. Kaul & K. K. Sharma, Creative Publishers 7. Chicago Manual of style PHI.
8. Essentials of Business Communication by Rajendra Pal & J. S. Korlahalli, Sultan Chand & Sons.
9. Business Communication by K. K. Sinh

SYLLABUS BCA SECOND YEAR

PRACTICAL I: DATABASE MANAGEMENT LAB.

Experiments based on the paper BCA 202. & 204

PRACTICAL II: DATA STRUCTURES LAB

Experiments based on the paper BCA 206. Atleast a 10 seat Language Lab must be established and used for English Communication(Language Skill, Oral Communications and Art of listening). Students are expected to go through well defined curriculum offered with English Language Lab Software and their competency shall be checked during external evaluation.(50 Marks) Candidates competency in other aspects of business communications shall be evaluated for remaining 50 marks.

SYLLABUS BCA THIRD YEAR

Duration : 3Hrs.	BCA-301	Marks (Max. 70, Min. 21)

OBJECT ORIENTED PROGRAMMING USING C++

UNIT – I

Different paradigms for problem solving, need for OOP, differences between OOP and procedure oriented programming, abstraction, overview of OOP principles- encapsulation, inheritance and data binding polymorphism. abstraction. C++ basics: structure of a C++ program, data types, declaration of variables, expressions, operators, type conversions, pointers and arrays, strings, structures, references, flow control statement, functions-scope of variables, parameter passing, recursive functions, default arguments, inline functions, dynamic memory allocation and deallocation operators.

UNIT – II

C++ classes and data abstraction : class definition, class structure, class objects, class scope, this pointer, static class members, constant member functions, constructors and destructors, dynamic creation and destruction of objects, friend function and class, static class member. Overloading : function overloading, operator overloading – unary, binary operators.

UNIT - III

Inheritance : defining a class hierarchy, different forms of inheritance, defining the base and derived classes, access to the base class members, base and derived class construction, destructors, virtual base class. Polymorphism: static and dynamic bindings, base and derived class virtual functions, dynamic binding through virtual functions, virtual function call mechanism, pure virtual functions, abstract classes, implications of polymorphic use of classes, virtual destructors.

UNIT – IV

Templates - function templates and class templates, overloading of function template, static class member in class template. Exception handling: benefits of exception handling, throwing an exception, the try block, catching an exception, exception objects, exception specifications, rethrowing an exception, catching all exceptions.

UNIT-V

File handling : stream classes hierarchy, stream I/O, file streams, opening and closing data file, creating a data file, read and write functions, error handling during file processing. Standard template library (STL): component of STL, containers, iterartors, algorithms, application of container classes.

Recommended books   :
Object Oriented Programming with C++ : E. Balagurusamy.

Duration : 3Hrs.	BCA-302	Marks (Max. 70, Min. 21)

VISUAL APPLICATION DEVELOPMENT USING VB.NET

Introduction to Microsoft .Net Framework 4.0. Getting Started with VB.Net 2010, exploring the Visual Studio IDE 2010. Variables, Constants, and Calculations; Decisions and Conditions; Working with functions, Procedures and Properties. String, Characters and Regulars Expressions.

Advance Features of Visual Basic 2010. Windows Forms and Controls. Menus, Common Dialog Control, context Menu; List and Loops; Array and Collections.
OO Design in VB 2010. writing custom classes. Exception handling. Files and Streams. Creating MDI Applications and Help System.

Introduction to ADO.Net. Data Access and Manipulation with ADO.Net. The Language Integrated Query (LINQ). Web Applications.

Data Access using Entity Framework. Windows Presentation Foundation (WPF). Data Binding with WPF, WPF Graphics. WPF Animations.

SYLLABUS BCA THIRD YEAR

Duration : 3Hrs.	BCA-303	Marks (Max. 70, Min. 21)

LINUX ENVIRONMENT

UNIT-I

Overview of Linux : What is Linux, Linux's root in Unix, Common Linux Features, advantage of Linux, Overview of Unix and Linux architectures, Linux files system, hardware requirements for Linux, Linux Internals: Introduction, Process amangement, System Calls.

UNIT-II

Linux File system : Logging in, getting familiar with Linux desktop, shell interface, understanding Linux Shell, Types of Text Editors, using vi editor, prompt character, correcting typing errors, simple shell commands-date, cal, who, tty, uname, passwd, bc, script, echo, logging out, Environment variables, wild card characters, *, ?, absolute and relative path, listing files and directories commands, navigating file system- pwd, cd, mkdir, rmdir, ls, pr, Handling ordinary files- cat, cp, mv, wc, rm, comm.., amp, diff, Basic files attributes – file permissions, changing permissions.

UNIT-III

Processes and filters : Simple filters- head, tail, cut, paste, sort, uniq, tr, Regular expression Grep utility, Shell command line, redirection, pipeline, spilt output, tee, and process- System Processes, internal and external commands, background process, premature termination of process, process priorities, process scheduling – (at, batch), nohup command

UNIT-IV

Shell Programming : Interactive scripts, Shell variables, assigning values to variables, positional parameters, command line arguments, arithmetic in shell script, exit status of a command, sleep and wait, script termination.

UNIT-V

Decision taking- if else, nested if, file tests, string tests, case control structure. Loop control structure- while, for, IFS, break, continue, $* and $@, logical operators & and executing script, Debugging a script, Debugging a script, executing multiple scripts

System Administration : Configuration of Linux, Installation of Linux, Connecting to remote machines- ftp, telnet, Adding and removing users.

SYLLABUS BCA THIRD YEAR

Duration : 3Hrs.	BCA-304	Mar ks (Max. 70, Min. 21)

MAN AGEMENT INFORMATION SYSTEM

Introduction System and Basic System : Concept, type of systems, The System Approach, Information Syste m: Definition, Need and types of Infor mation System, Information System in Organissation, Management, Strategy, role of Information System in Organisation, Business Strateg y, Decision Making

Management Information S ystem : Meaning and Characteristics, Major types of Management Information System, Information Reporting System (IRS), Decision Support System (DSS), Executive Inf ormation System (EIS), Knowledge Based System (KBS), Group Discussion Support System (GDSS), Characteristics of GDSS, Relationship of Management Information System and Operation Information System, Re quirements of a successful MIS, Limitation of MIS, Structure of MIS.
Levels of MIS, Planning, Forecasting, Control, Modeling, Computing, Database Administration, Implementati on of MIS for Decision Making, Simon's M odel of decision Making, Programmed Vs Non- Programmed Decisions.

Planning and Organizing with MIS: Information Planning, need of inf ormation for an organization, Steps in process of Strategic Planning, Managing international information system : The growth of international information system, Organising international information system managing global system. Implementation, E valuation and Maintenance of the MIS: Im plementation of MIS, steps and methods, Documentation, Evaluation of MIS, structure for evaluation, Maintenance of MIS.

Information technology Infrastructure: Computer hardware & software, system software, Categories of co mputer and Computer system, Information technology infrastructure, Storage input a nd output, telecommunication and Networks.

SYLLABUS BCA TH IRD YEAR

Duration : 3Hrs.	**BCA-305 & 306**	**M rks (Max. 100, Min. 35)**

PRA CTICAL I : LINUX.

Experiments based on the paper BCA 302.

PRACTICAL II : VISUAL PROGRAMMING. & Web Designing Lab.

Experiments based on the paper BCA 303.

SYLLABUS BCA THIRD YEAR

PROJECT

Students are required to complete Project allotted by the department, which will include the system design and implementation, (carrying equal weight-age of the total marks). Presentation / Seminar / viva will be based on the project work carried during the semester.

Report Format

Arrangement of Contents : The sequence in which the project report material should be arranged and bound should be as follows:

A.   Cover Page & Title Page
B.   Abstract
C.   Conclusion
D.   Table of Contents
E.   List of Tables
F.   List of Figures
G.   Scope of Project

      a.   Chapters

      b.   Feasibility Study

      c.   Project Scheduling

      d.   Requirement Analysis

      e.
         Application Design
         i.   Design Overview
         ii.   Design Description
            1.   Flow Chart
            2.   Data Flow Diagram
            3.   Control Flow Diagram
            4.   UML Diagram
         iii.   Database Design
            1.   ER Diagram
            2.   Table   –
         Relationship Diagram
         iv.   Test Plans
            1.   Test case Analysis
         v.   Implementation
         vi.   Testing (tools if any)

H.   Future Works
I. Appendices
J. References

NOTE: The table and figures shall be introduced in the appropriate places.

Page Dimension & Binding Specifications : The dimension of the project report should be in A4 size.

The project report should be bound using flexible cover of the thick plastic paper (Spiral Binding). Report should use Font Arial/ Times New Roman; Font Size: 14 (For Headings Bold) and 12 (For Paragraphs). Document can have maximum of 1.5 lines spacing.

Guidelines for Project

1. Project Report (BCA-307)

- **The project proposal should be prepared in consultation with your guide.** The project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken. **The project work should compulsorily include the software development.** The Project carries 100 marks.
- The project should contain complete details in the following form:

(i) Title of the Project

(ii) Introduction and Objectives of the Project

(iii) Project Category (RDBMS/OOPS/Networking/Multimedia/Artificial Intelligence/Expert Systems etc)

(iv) Tools/Platform, Hardware and Software Requirement specifications

(v) Problem Definition, Requirement Specifications (Detailed functional Requirements and Technical Specifications), Project Planning and Scheduling (Gantt chart/PERT chart)

(vi) Scope of the solution

(vii) Analysis (DFDs, ER Diagrams/Class Diagrams etc. as per the project requirements)

(viii) A complete structure which includes:

- Number of modules and their description to provide an estimation of the student's effort on the project
- Data Structures as per the project requirements for all the modules.

- Process Logic of each module

- Implementation methodology

- List of reports that are likely to be generated

(ix) Overall network architecture (if required for your project)

(x) Implementation of security mechanisms at various levels

(xi) Future scope and further enhancement of the project

(xii) Bibliography

2. Project completed in all aspects with necessary enclosures should be submitted to the concerned IGC. The IGC will forward those Projects to the Service Providers. The Service Providers will forward a copy of the Project to the Director, SODEL JNU Jaipur with the award sheet after evaluation from a university recognized examiner.

3. A **photocopy of the complete Project** should be retained by the student for future reference.

4. The project is a part of your final Year curriculum. Students are eligible to submit the project proposals after Second year BCA.

5. In case the students require any project trainee letter from the University for doing a project in any organization / software company, they can get a **"Project Trainee letter"**

6. *Please ensure that at any given point of time, a guide should not provide guidance for more than 5 BCA students of JNU-Jaipur.*

7. **Violation of the project guidelines will lead to the rejection of the project at any stage.**

<div style="border:1px solid black; text-align:center; font-weight:bold;">

Project Report

</div>

1.   **Project Report :**

The project report **should** contain the following:

i)   Certificate of Originality
ii)   A CD consisting of the executable file(s) of the complete project should be
attached on the last page of the project report. In no case, it should be sent separately.

2. The **project** may be about 60 to 70 pages (excluding coding). The project documentation
details should not be too generic in nature. Appropriate project report documentation should be
done, like, **how you have done the analysis, design, coding, use of testing techniques /
strategies, etc.,** *in respect of your project.* To be more specific, whatever the theory in
respect of these topics is available in the reference books should be avoided as far as possible.
The project documentation should be in respect of your project only. The project
documentation should include the topics given below. Each component shown below carries
certain weightage in the project report evaluation.

➢   Table of Contents / Index with page numbering
➢   Introduction / Objectives
➢   System Analysis

▪   Project Planning
▪   Project Scheduling
▪   Software requirement specifications (SRS)
▪   Software Engineering Paradigm applied
▪   Data model, Control Flow diagrams, state Diagrams/Sequence diagrams
➢   System Design

▪   Modularization details
▪   Data integrity and constraints
▪   Database design/Procedural Design/Object Oriented Design
▪   User Interface Design

➢   Coding

▪   Complete Project Coding
▪   Comments and Description
▪   Standardization of the coding/Code Efficiency
▪   Error handling
▪   Parameters calling/passing
▪   Validation checks

➢   Testing

▪ Testing techniques and Testing strategies used ***along with the test case designs*** and test report.

▪ Debugging and Code improvement

➢ System Security measures (Implementation of security for the project developed)

▪ Database/data security
▪ Creation of User profiles and access rights

➢ Cost Estimation of the Project
➢ Reports (sample layouts should be placed)
➢ PERT Chart, Gantt Chart
➢ Future scope and further enhancement of the Project
➢ Bibliography
➢ Appendices (if any)
➢ Glossary.

Attach a copy of the CD containing the executable file(s) of the complete project.

3. The project report should normally be printed with 1.5 line spacing on A4 paper (one side only). All the pages, tables and figures must be numbered. Tables and figures should contain titles.

4. Throughout the project report, the title of the project should be the same as per the approved synopsis. Signature of the Project Guide in the Certificate of Originality should match with the signature in the Project Proposal proforma also.

5. **Only one copy of the original project report** in the bound form along with the CD (containing the executable file(s) of the project should be enclosed in the last page) is to be submitted to theIGC concerned. One photocopy of the same Project Report and the CD containing the executable file(s) must be retained by the student, which should be produced before the examiner at the time of viva-voce.

6. A photocopy of the project report is **not acceptable** for submission. Kindly mention on the top of the envelope **MCA PROJECT REPORT (BCA-307)**

7. Title of the project should be kept the same through out the project.

GUIDELINES FOR PROJECT EVALUATION

Project Evaluation

The Project Report is evaluated for 100 marks. In project (BCA-307) a student must secure **50% marks to pass the examination**

Unfair means

Projects copied from other students will be considered to have used unfair means. If Two projects are found identical zero marks will be awarded to both of them. In such a case the projects will have to be resubmitted on new topic**.**

CERTIFICATE OF ORIGINALITY

This is to certify that the project report entitled _____

_____

submitted to **Jaipur National University, Jaipur** in partial fulfilment of the requirement for the award

of the degree of **BACHELOR OF COMPUTER APPLICATIONS (BCA)**, is an authentic and original

work carried out by Mr. / Ms. _____ with enrolment number

_____ under my supervision and guidance.

The matter embodied in this project is genuine work done by the student and has not been

submitted whether to this University or to any other University / Institute for the fulfilment of the

requirements of any course of study.

…………………………   ………………………….

Signature of the Student: Signature of the Guide

Date : …………………..   Date: ………………….

Name and Address   Name, Designation and

of the Student: Address of the Guide:

_____   _____

_____   _____

Enrolment No.: _____

JAIPUR NATIONAL UNIVERSITY

COURSE CODE: BCA-307

TITLE OF THE PROJECT

Submitted to the

School of Distance Education & Learning

in partial fulfillment of the requirements

for the award of the degree

Bachelor of Computer Applicatiions (BCA)

Year of Submission

Supervisor's Name _____   Student's Name: _____

& Designation: _____   Enrolment No.:   _____

Roll No. _____

JAIPUR NATIONAL UNIVERSITY

School of Distance Education & Learning

Jagatpura, Near New RTO, Agra By-pass Road Jaipur-302017