JAI NARAIN VYAS UNIVERSITY

BACHELOR OF COMPUTER APPLICATIONS (BCA)

General Information for Students

1. The course of study of Bachelor of Computer Applications shall extend over a period three years. On satisfactory completion of the course and after passing the examinations including the project and seminars, a candidate will be awarded the BCA.

2. The candidate must posses (10+2) at school level with any stream with at least 45% marks in aggregate (40% marks in case of SC/ST and OBC candidates) without any approximation in the said Examination.

3. The term of regular course of study means that a candidate shall have attended 75% of total number of lectures and course work (Tutorial) in each written paper and 75% of the course work (Practical and Sessional) as per teaching and examination scheme in each year. Further he shall have completed his project and seminar. The attendance requirement scheme be as per Ordinance of the University which is reproduced below :-

   O. 78-A (1): For all regular candidates in the faculties of Arts, Education and Social Sciences, Science, Law, Commerce and Engineering the minimum attendance requirement shall be that a candidate should have attended at least 75% of the lectures delivered and the tutorials held taken together as well as 75% of the practicals and session from date of her/his admission.

   (2) Condonation of shortage of attendance: The shortage of attendance upto the limits specified below may be condoned on valid reasons:

   (i) Upto 6% in each subject plus 5 attendance in all aggregate of subject/papers may be condoned by the Vice-Chancellor on the recommendation of the Dean/Director/Principal for undergraduate students and on the recommendation of the Head of the Department for the Post-graduate classes.

   (ii) The NCC/NSS cadets sent out to parades and camps and such students who are deputed by the University to take part in games, athletics or cultural activities may for purposes of attendance be treated as present for the days of these absence in connection with the aforesaid activities and that period shall be added to their subject wise attendance.

4. For a pass, a candidate should obtain 35% marks in each theory paper, 40% marks in each practical, sessional and 40% marks in aggregate of the year.

5. (a) If a candidate fails in not more than three units in first year examination and obtain 40% marks in aggregate, he/she shall be allowed to be regular candidate in the second year. For the purpose of this clause each theory paper and each practical shall be counted as a separate unit.

   (b) If a candidate, fails in not more than three units inclusive of first year and second year he/she shall be allowed to be a regular candidate in the third year.

   (c) If a candidate has cleared all the units of first & second year, and has failed in not more than three units of third year he/she shall be eligible for supplementary examination that will be held after declaration of result of third year.

   (d) All those candidates who are unable to clear their back papers for first year & second year with third year examination shall not be eligible for supplementary examination. Such candidate will have to wait for a year & they will have to appear for these back papers along with the regular examination of first, second & third year respectively.

6. Ex – students :

(a) If a student fails in more than three units of theory papers of the annual examination, but pass in all the practicals, he/she shall be allowed to appear as ex-student. The marks secured in the practicals and course work, laboratory sessionals of the last year shall be carried over to the next examination.

(b) If a candidate fails in more than three units of theory and practical at the annual examination. He/she shall appear as an ex-student at the next year examination in all theory papers, practicals and sessionals.

7. Award of Division :

The division given below shall be awarded on the basis of the total marks obtained from first to third year (all taken together) by the candidate for the degree of BCA.

(i)	Honours	75% and above
(ii)	First Division	60% and above
(iii)	Second Division	45% and above
(iv)	Pass Division	40% and above

8. A candidate shall be allowed to appear as an ex-student for a maximum of two consecutive years. If the candidate is unable to pass the examination in two consecutive years, he will neither be allowed to continue his studies in BCA course nor to re-appear at the same examination.

Bachelor of Computer Applications

Three Year Degree Course

Syllabus for Teaching and Examination Scheme for BCA

Note: The breakup of Theory and Laboratory examination shall be as follows:

1. Breakup of marks is as 20% internal and 80% main exam marks.
2. Laboratory Records 20% (on the basis of performance, record and attendance in laboratory class) and it will be awarded by the class teacher.
3. Performance in Laboratory examination: 60%, which cover various aspects as circuit diagram, formula, algorithms, results etc. The students will be asked to attempt one exercise.
4. BCA-106 Environmental Studies: Its marks will not be added for award of division

BCA- YEAR-I

CODE	SUBJECT	Hrs./Week		Exam Hrs.	Max. Marks		
	THEORY	**L**	**P**		**IA**	**Exam**	**Total**
BCA -101	FUNDAMENTALS OF MATHEMATICS	3		3	20	80	100
BCA -102	PROGRAMMING WITH 'C'	3		3	20	80	100
BCA -103	INTERNET TECHNOLOGY	3		3	20	80	100
BCA -104	FUNDAMENTALS OF COMPUTERS	3		3	20	80	100
BCA -105	DIGITAL LOGIC	3		3	20	80	100
BCA -106	ENVIRONMENTAL STUDIES	3		3	20	80	100
	PRACTICAL						
BCA -107	HTML LAB		6	3	20	80	100
BCA-108	C PROGRAMMING LAB		6	3	20	80	100
BCA-109	MS OFFICE LAB		6	3	20	80	100
BCA-110	DIGITAL ELECTRONICS LAB		6	3	20	80	100
	TOTAL				**200**	**800**	**1000**

BCA- YEAR-II

CODE	SUBJECT	Hrs./Week		Exam Hrs.	Max. Marks		
	THEORY	**L**	**P**		**IA**	**Exam**	**Total**
BCA -201	OPERATING SYSTEM	3		3	20	80	100
BCA -202	DATA STRUCTURES & ALGORITHMS	3		3	20	80	100
BCA -203	PROGRAMMING WITH C++	3		3	20	80	100
BCA -204	COMPUTER SYSTEM ARCHITECTURE	3		3	20	80	100
BCA -205	DBMS	3		3	20	80	100
BCA -206	VISUAL PROGRAMMING	3		3	20	80	100
	PRACTICAL						
BCA -207	VISUAL BASIC .NET LAB		6	3	20	80	100
BCA-208	ORACLE SQL LAB		6	3	20	80	100
BCA-209	PROGRAMMING C++ LAB		6	3	20	80	100
BCA-210	8085 MICROPROCESSOR LAB		6	3	20	80	100
	TOTAL				**200**	**800**	**1000**

BCA- YEAR- III

CODE	SUBJECT	Hrs./Week		Exam Hrs.	Max. Marks		
	THEORY	**L**	**P**		**IA**	**Exam**	**Total**
BCA -301	JAVA PROGRAMMING	3		3	20	80	100
BCA -302	MULTIMEDIA TOOLS	3		3	20	80	100
BCA -303	COMPUTER NETWORKS	3		3	20	80	100
BCA -304	WEB TECHNOLOGIES	3		3	20	80	100
BCA -305	SYSTEM ANALYSIS & DESIGN	3		3	20	80	100
BCA -306	COMMUNICATION SKILLS	3		3	20	80	100
	PRACTICAL						
BCA -307	JAVA LAB		6	3	20	80	100
BCA-308	ASP .NET LAB		6	3	20	80	100
BCA-309	PROJECT WORK		6	3	40	160	200
BCA-310	SEMINAR		3	3	20	80	100
	TOTAL				**220**	**880**	**1100**

DEAILED COURSE STRUCTURE

BCA FIRST YEAR

BCA 101 FUNDAMENTALS OF MATHEMATICS

Set, Relation and Functions: Set, Cartesian product of sets, relations, functions, binary operations.
Trigonometric Functions: Angles, trigonometric functions and trigonometric identities.
Cartesian system of rectangular coordinates: The number plane, distance formula area of a triangle, section formulae, slope of a line, locus and equation.

Straight line: To find equation of a straight line parallel to an axis: the point slope form, two point form, intercept form, slope-intercept form, normal form, condition of concurrency for three straight lines, analytical proof of geometric theorems.

Circle and family of circles: Standard form of equation of a circle, its general form, condition of tangentancy.

Quadratic equation : Solution of quadratic equations, symmetric functions of roots.

Determinants and Matrices: Properties and applications, definition and type of matrices, elementary transformation of a matrix, inverse of a matrix, normal form of a matrix, orthogonal matrices.

BCA 102 PROGRAMMING WITH C

Program Concept, Characteristics of Programming, Various stages in Program Development Programming aids Algorithms, Flow Charts - Symbols, Rules for making Flow chart, Types of flowchart, Advantage & Disadvantage, Pseudocodes, Decision Table, Programming techniques & tools Programming Techniques – Top down, Bottom up, Modular, Structured - Features, Merits & Demerits, Comparative study, Programming Logic- Simple, Branching, Looping, Recursion, Cohesion & Coupling, Programming Testing & Debugging & their Tools .

Introduction & features of C, Structure of C program, Variables, Expressions, Identifiers, Keywords, Data Types, Constants, Operator and expression Operator: Arithmetic, Logical, Relational, Conditional and Bit wise Operators, Precedence and Associativity of Operators, Type conversion in expression, Basic input/output and library functions Single character input/output i.e. getch(), getchar(). getche(), putchar(),Formatted input output i.e. printf() and scanf(), Library functions - concepts, Mathematical & Character functions.

If statement, If.....Else statement, Nesting of If....Else Statement, else if ladder, The ?: operator, goto statement, Switch statement, Compound statement, Loop controls, for, while, do-while loops, break, continue, goto statement, ARRAYS Single and Multi Dimensional arrays, Array declaration and initialization of arrays, Strings : declaration, initialization, functions**.**

The need and form of C functions, User defined and library function, Function arguments, Return values and nesting of function, Recursion, Calling of functions, Array as function argument, Scope and life of variables - local and global variable, Storage class specified - auto, extern, static, register.

Defining structure, Declaration of structure variable, Accessing structure members, Nested structures, Array of structure, Structure assignment, Structure as function argument, Function that return structure, Union, pointers, working with text files.

BCA 103 INTERNET TECHNOLOGY

Internet: Evolution, Concepts, Internet Vs Intranet, Growth of Internet, ISP, ISP in India, Types of connectivity - Dial-up, Leased line, DSL, Broadband, RF, VSAT etc., Methods of sharing of Internet connection, Use of Proxy server. Internet Services – USENET, GOPHER, WAIS, ARCHIE and VERONICA, IRC

WORLD WIDE WEB (WWW) - History, Working, Web Browsers, Its functions, URLs, web sites, Domain names, Portals. Concept of Search Engines, Search engines types, searching the Web, Web Servers, TCP/IP and others main protocols used on the Web. E-Mail: Concepts, POP and WEB Based E-mail, merits, address, Basics of Sending & Receiving, E-mail Protocols, Mailing List, Free E-mail services, e-mail servers and e-mail clients programs.

Concepts of Hypertext, HTML introduction, features, uses & versions Using various HTML tags, Elements of HTML syntax, Head & Body Sections, , Inserting texts, Text alignment, Using images in pages, Hyperlinks – text and images, bookmarks, Backgrounds and Color controls, creating and using Tables in HTML, and presentation, Use of font size & Attributes, List types and its tags. Cascading Style sheets – defining and using simple CSS. Design tools for HTML, Overview of MS FrontPage, Macromedia Dream weaver, and other popular HTML editors, designing web sites using MS FrontPage (using at least FrontPage 2000) Use of Frames and Forms in web pages, Image editors, Issues in Web site creations & Maintenance,

E - Commerce An introductions, Concepts, Advantages and disadvantages, Technology in E- Commerce, Internet & E-business, Applications, Feasibility & various constraints. E-transition challenges for Indian corporate, the Information Technology Act 2000 and its highlights related to e-commerce.

Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Digital Token-Based Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit Card-Based Electronic Payment Systems, Risk and Electronic Payment Systems. E-security – Security on the internet, network and web site risks for e-business, use of firewalls, secure physical infrastructure.

BCA 104 FUNDAMENALS OF COMPUTERS

Brief history of development of computers, Computer system concepts, Computer system characteristics, Capabilities and limitations, Types of computers-Analog, Digital, Hybrid, General, Special Purpose, Micro, Mini, Mainframe, Super, Generations of computers, Personal Computer (PCs) - IBM PCs, characteristics, PC/PCXT/PCAT - configurations, Pentium and Newer PCs specifications and main characteristics. Types of Pcs- Desktop, Laptop, Notebook, Palmtop, Workstations etc. their characteristics. Basic components of a computer system - Control unit, ALU, Input/Output functions and characteristics, memory - RAM, ROM, EPROM, PROM and other types of memory.

Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen, Monitors - characteristics and types of monitor -Digital, Analog, Size, Resolution, Refresh Rate, Interlaced / Non Interlaced, Dot Pitch, Video Standard - VGA, SVGA, XGA etc, Printers - Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer, Plotter, Sound Card and Speakers, Storage fundamentals - Primary Vs Secondary Data Storage and Retrieval methods - Sequential, Direct and Index Sequential, Various Storage Devices - Magnetic Tape, Magnetic

Disks, Cartridge Tape, Hard Disk Drives, Floppy Disks (Winchester Disk), Optical Disks, CD, VCD, CD-R, CD-RW, Zip Drive.

Need, Types of Software - System software, Application software, System Software - Operating System, Utility Program, Programming languages, Assemblers, Compilers and Interpreter, Operating Systems - Functions, Types- Batch, Single, Multiprogramming, Multiprocessing, Programming languages- Machine, Assembly, High Level, 4GL, their merits and demerits, Application Software - Word-processing, Spreadsheet, Presentation Graphics, Data Base Management Software, characteristics, Uses and examples and area of applications of each of them, Virus working principles, Types of viruses, virus detection and prevention, viruses on network.

Analog and Digital Signals, Modulations - Amplitude Modulation (AM), Frequency Modulation (FM), Phase Modulation (PM), Communication Process, Direction of Transmissions Flow - Simplex, Half Duplex, Full Duplex, Communication Software, Communication Protocols, Communication Channels - Twisted, Coaxial, Fiber Optic, Serial and Parallel Communication, Modem - Working and characteristics, Types of Connections - Dialup, Leased Lines, ISDN, Types of Network - LAN, WAN, MAN etc., Topologies of LAN - Ring, Bus, Star, Mesh and Tree topologies, Components of LAN -Media, NIC, NOS, Bridges, HUB, Routers, Repeater and Gateways, Use of Communication in daily life.

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 - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc, External - CHKDSK, XCOPY, PRINT, DISKCOPY, DISKCOMP, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, EDIT, MODE, ATTRIB, HELP, SYS etc. Executable V/s Non executable files in DOS.

BCA 105 DIGITAL LOGIC

Logic Gates, AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates, Boolean Algebra, Basic Boolean Law's, Demorgan's theorem, MAP Simplification, Minimization techniques, K -Map, Sum of Product & Product of Sum

Data types and Number systems, Binary number system, Octal & Hexa-decimal number system,1's & 2's complement, Binary Fixed- Point Representation, Arithmetic operation on Binary numbers, Overflow & underflow, Floating Point Representation, Codes, ASCII, EBCDIC codes, Gray code, Excess-3 & BCD, Error detection & correcting codes

Combinational & Sequential circuits, Half Adder & Full Adder, Full subtractor, Flip-flops - RS, D, JK & T Flip-flops, Shift Registers, RAM and ROM, Multiplexer, Demultiplexer, Encoder, Decoder, Idea about Arithmetic Circuits, Program Control, Instruction Sequencing

I/O Interface, Properties of simple I/O devices and their controller, Isolated versus memory-mapped I/O, Modes of Data transfer, Synchronous & Asynchronous Data transfer, Handshaking, Asynchronous serial transfer, I/O Processor

Auxiliary memory, Magnetic Drum, Disk & Tape, Semi-conductor memories, Memory Hierarchy, Associative Memory, Virtual Memory, Address space & Memory Space, Address Mapping, Page table, Page Replacement, Cache Memory, Hit Ratio, Mapping Techniques, Writing into Cache

BCA 106 ENVIRONMENTAL STUDIES

The multidisciplinary nature of environmental studies, Definition, scope and importance. Need for public awareness.

Natural Resources

Renwel of non-renewable resources: Natural resources and associated problems.

a).Forest resources: Use and over-exploration, deforestation, mining and their effects on forest and tribal people.

b).Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, benefits

and problems.

c).Mineral resources: Use and exploitation, environmental effects of extracting and using minerals resources.

d) Food resources: World food problem, changes caused by Agriculture and overgrazing, effects of modern agriculture, Fertilizer-pesticide problems.

e). Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy source.

f).Land resource: Land as a resource, land degradation, soil erosion and desertification.

Conservation of Natural Resources

Equitable use of resources for sustainable development.

Ecosystem

Concept of Ecosystem, structure and function of an ecosystem, Producers, consumers and decomposers. Energy flow in the ecosystem. Food Chains, food webs and ecological pyramids.Introduction types, characteristics features, structure and function of following ecosystems:

a). Forest ecosystem

b). Desert ecosystem

c). Aquatic ecosystem (Ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and its conservation: Introduction-Definition : genetic, species and ecosystem diversity. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and opinion values.

Biodiversity at global, national and local levels. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Important Endangered and endemic species of India.

Environmental Pollution: Definition, causes, effects and control measures of:

a). Air Pollution

b). Water Pollution

c). Soil Pollution

d). Noise Pollution

e). Thermal Pollution

f). Nuclear Hazards

Soil water Management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Role of NGOs.

BCA 107 HTML LAB

1. Design a simple HTML document using basic elements like:
2. <HTML>, <body>, <head>, <title>,
, <hr>.
3. Design a HTML document which show the use of following Text formatting tag:
4. center, sup, em, ins, sub, font, h1 to h6.
5. Design a HTML document to demonstrate all computer output tag:
6. code, kbd, samp, tt, var, pre, listing, xmp.
7. Design a HTML document which demonstrate the use of following tag: abbr, acronym, address, bdo, blockquote, q.
8. Apply these character entities in your HTML document:
9. Non-breaking space
    a. <
    b. >
    c. “
    d. &
    e. ,
10. Demonstrate how to create a link in an HTML document.
11. Demonstrate how to use an image as a link in HTML document.
12. Demonstrate how to link to another page by opening a new window…
13. Demonstrate how to use a link to jump to another part of same document.
14. Demonstrate how to make a vertical and horizontal frameset with three different documents.
15. Design a HTML document which does not allow a user to resize frame.
16. Demonstrate how to make a navigation frame. This navigation frame contains a list of links with the second frame as the target.
17. Design a HTML document which shows how to jump to a specified section in a frame.
18. Design a HTML document having
19. Colored background table.
20. Table having image in background.
21. Colored background cell.
22. Table having image in only one cell.
23. Demonstrate how to use the “frame” attribute (with values like: box, void, above, below, hside, vside, lhs, rhs) and border attribute to control the borders around the table.

BCA 108 C PROGRAMMING LAB

1. Write a program to show the use of arithmetic operations and library functions in evaluating expressions.
2. Write a program to show the use of Input Output statement.
3. Write a program to show the use of if – else statement.
4. Write a program to show the use of switch statement.
5. Write a program to show the use of one dimensional and multi dimensional arrays.
6. Write a program to show the use of while statement.
7. Write a program to show the use of Do while statement.
8. Write a program to show the use of for statement.

9. Write a program to show the use of functions.
10. Write a program to show the use of recursion.
11. Write a program to define and use a structure.
12. Write a program to manipulate strings.

BCA 109 MS OFFICE LAB

1. Write a paragraph in MS-Word and show the use of various tools.
2. Write an application & copy it to another document and differentiate between paste and paste special.
3. How to Insert a picture or chart in a document and reference it to another document?
4. Write a paragraph in MS-Word of 12 lines and Explain these Formatting tools:-
   - Columns.
   - Drop cap.
   - Paragraph.
   - Alignment.
   - Bullet and Numbering.
   - Tab Setting.
5. What is mail merge? How to use this facility? Describe it Step by Step.
6. Create a Student Table(Rno, Name, Fname, Class, Address, Phone and insert 5 records in it.
7. To study various charts and their implementations using a marksheet of 10 students.
8. Create a salary statement of an organization of 10 employees using if condition (S.no. , Name, Designation, Basic, Da, Hra, total, net salary)
9. What is a pivot table? How to create and use a pivot table?
10. Create a power point presentation to present your institution detail, create at least 7 slides with different animation effect.
11. Create a power point presentation on “destination India” using images from clipart.
12. Create a power point presentation on “youth icon of India” and show the following
13. Custom Animation.
14. Compare and Merge Presentations.
15. Slide Design.
16. Cascade.

BCA 110 DIGITAL ELECTRONICS LAB

1. Verify various logic gates : NOT, AND, OR, NAND, NOR, XOR AND XNOR
2. Verify various Boolean Laws
3. Verify NAND gate as Universal Gate
4. Verify NOR gate as Universal Gate
5. Realize Half – Adder and Half-Subtractor Circuit.
6. Realize Full – Adder and Full-Subtractor Circuit.
7. Realize BCD to Seven segment Decoder
8. Realize RS Flip flops using NAND and NOR gates.
9. Realize D flip flops using NOR and NAND gates.
10. Realize JK Flip Flop using gates.
11. Realize JK Flip Flop using IC.
12. Realize 3 bit ripple up counter
13. Realize 3 bit ripple down counter
14. Realize mod-5 counter
15. Realize mod-10 counter

BCA SECOND YEAR

BCA 201 OPERATING SYSTEMS

Definitions, functions and types of operating system, System components, Operating system Services, System Calls, System programs, System structure.

Process Concepts, process state & process control block, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling Real-Time Scheduling, Threads, Threads in Linux.

Critical Section Problem , Semaphores, Classical Problem Of Synchronization, , Deadlock Characterizations, Method for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock, Process Scheduling in Linux.

Logical versus physical address space, Swapping, Contiguous Allocating, Paging, Segmentation, Virtual Memory, Demand Paging, Performance of Demand Paging, Page Replacement, Page Replacement Algorithms, Memory Management in Linux.

Disk Scheduling, Disk Management, Swap Space Management, Disk reliability, Stable Storage Implementation. File Concepts Directory structure, Protection, File system in Linux

BCA 202 DATA STRUCTURES AND ALGORITHMS

Elementary data Structures: Arrays and Records, STACKS: Definition, implementation, operations on stack, application of stacks, evaluation of arithmetic expression and recursion, Prefix fix and post fix notations, evaluation of post fix expression using stacks.

Queues: Queue data structure, implementation, operations on queues, Circular queue.

Linked lists: Singly linked list, Ordered list, Inserting and deleting element from ordered lists, Circularly linked list, Doubly linked list, Application of linked list: Implementations stack and queue using linked lists.

Trees: Concepts and terminology, Binary tree, Linear and linked representation of binary tree, Operation on a tree, Tree traversal, Inorder, Preorder and post order traversal.

Graphs: Representation, Adjacency matrix, Graph traversal, Breadth first search and Depth first search traversal.

Searching and Sorting: Sequential searching, binary searching, Hashing, Hashing methods, Internal and external sorting, Selection, Insertion, Bubble and quick sort algorithms.

BCA 203 OBJECT ORIENTED PROGRAMMING WITH C++

Principles of OOP, data hiding, encapsulation, inheritance, polymorphism, overloading. C++: Token, keywords, basic, user defined and derived data types, variables, dynamic initialization of variables, reference variables, operators, control structures.

Functions, function overloading, classes and objects, friendly functions, construcut5ors and destructors : operator, overloading, rules of overloading operators.

Inheritance, single, multilevel, multiple, hierarchical, hybrid inheritance, pointers, virtual functions, polymorphism and working with files. Templates, Naming space.

Objects and interfaces, overloaded methods, state method, constructors, references, class inheritance, null, thin and super variable, encapsulation, access modifiers, interfaces, packages, strings and characters, files and streams, sequential access files, random access files.

Data structures, linked lists, stacks, queues, trees, dynamic memory allocation. Exception handling, throwing, catching and rethrowing and exception, exceptions and inheritance.

BCA 204 COMPUTER SYSTEM ARCHITECTURE

Micro operations: Bus transfer, Memory transfer, Arithmetic and logic micro-operations, Control functions, Instruction codes: Computer instructions, Timing and control,instruction cycles, I/O and interrupt.

I/O Architecture: I/O devices and their controllers, Hex keyboard, LED Display, VDU, Floppy disk drive, Transfer of information between I/O devices, CPU and memory, Elementary concept of I/O mapped and memory mapped I/O, Direct memory Access.

CPU Organization: Data bus and address bus, ALU, Instruction formats, Addressing modes-Direct, indirect, Immediate, Indexed and relative. Addressing formats one, two and three addresses.

Microprocessor: Organization of 8085 microprocessor, Instruction set of 8085, Mnemonics and operation codes of data transfer group, Arithmetic group, Logic group, Branches group and stack, I/O and Machine control group, Assembly language, Assembler, Simple programs in assembly language.

BCA 205 DATABASE SYSTEM CONCEPTS

Purpose of the data base system, data abstraction, data model, data independence, data definition language, data manipulation language, data base manager, data base administrator, data base users, overall structure.

ER Models, entities, mapping constrains, keys, E-R diagram, reduction E-R diagrams to tables, generatio, aggregation, design of an E-R data base scheme.

Oracle RDBMS, architecture, kernel, system global area (SGA), data base writer, log writer, process monitor, archiver, database files, control files, redo log files, oracle utilities.
SQL: commands and data types, data definition language commands, data manipulation commands, data query language commands, transaction language control commands, data control language commands.

Joins, equi-joins, non-equi-joins, self joins, other joins, aggregate functions, math functions, string functions, group by clause, data function and concepts of null values, sub-querries, views.

PL/SQL, basics of pl/sql, data types, control structures, database access with PL/SQL, data base connections, transaction management, data base locking, cursor management.

BCA 206 VISUAL PROGRAMMING

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser.

The environment: Editor tab, format tab, general tab, docking tab. visual development & event drive Programming -Methods and events.

The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable Number of Argument Optional Argument, Returning value from function,Control flow statements: conditional statement, loop statement. Msgbox & Inputbox.

Working with Forms : Loading, showing and hiding forms, controlling One form within another.
GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar.There Properties, Methods and events. OpenFileDilog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog. Link Label.
Designing menues : ContextMenu, access & shorcut keys.

Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.
Generate Reports Using CrystalReportViwer

BCA 207 VB .NET LAB

1.Design a form in vb.net using the following controls

- 3 TextBoxes
- 4 Buttons

Task to be performed

- Change the text of the buttons as
- Button1 “+”
- Button2 “-“

- Button3 "*"
- Button4 "/"
- input values on textbox1 and textbox2 and display the result on textbox3 according to the type of the button clicked.

2. Using the above form Display the result on textbox3 when any changes made on Textbox1 and Textbox2.
3. Design a simple Text Editor in vb.net to implement find and replace operation.
4. Design 2 ListBoxes on a Form

Task to be performed

- Add at least 5 Items on Listbox1
- Display the selected item on the Textbox
- Remove selected item from the ListBox1
- Move selected item of ListBox1 into ListBox2

5. Design a form using 1 ListBox and 1 textBox

Task to be performed

- Add 5 items on ListBox
- Highlight the item of the ListBox , if typed character/s on TextBox1 is matched with the character/s of the ListBox.

6. Design MDI (Multiple Document Interface) Form in vb.net that consists of MenuBar and ToolBar.
7. Create a basic text editor that enables user to open the selected text file on TextBox.

Hint. Use OpenFileDialog control

8. Design a form using checkboxes and radiobuttons

Task to be performed

- Display the text of selected checked boxes and RadioButton

9. Create a digital clock using timer and label controls
10. Design a form using TextBox and Horizontal Scroll Bar. Change the background colour of the textbox as the Horizontal Scroll Bar is Scrolled
11. Create a database **"employee.mdb"** in ms-access.
    Create a table emp whose fieilds are as follows
    - EmpId
    - EmpName
    - Emp_Dept
    - Emp_salary

Task to be performed

- Establish the connection to employee.mdb
- Display the first record of emp on TextBoxes used on form.
- Display all the records on DataGridView control

BCA 208 ORACLE SQL LAB

1. Display all the employees' details that belong to department 10.
2. Display employees name along with their Salary who are MANAGER.
3. Display the employees who are getting Salary between 12000 and 25000.
4. Display the annual Salary of employees of dept. 30.
5. Display employees that are CLERK and managed by 7698.
6. Display employees of department 10 and 20.
7. Display employees that are not managers.
8. Display employees whose name begins with Character 'R'.
9. Display employees that are analyst but getting salary greater than 10000.
10. Display employees those are not getting any commission.
11. Display all the employees name along with their jobs.
12. Display all the employees having 'A' in their names.
13. Display all the employees having T and 'R' in their names.
14. Display employees that are not there in department 30.
15. Display Department located in 'xxx'.
16. Display all the employees who are not 'SALESMAN' or 'CLERK'.
17. Display all the employees Names in lowercase.
18. Display all employees name with their length.
19. Display all the employees who are not MANAGERS.
20. Write a query to calculate the length of time any employee has been with the company.
21. List the employee name and salary increased by 15% and expressed as a whole number.
22. List all the employees who joined after '01-jan-2000' and before 18-aug-2005.
23. Display the difference between Highest and the lowest salary for each department.
24. List all jobs for MANAGER and difference between Average and maximum salary.
25. Display Minimum and Maximum salary for each job type.
26. Display employees who earn more than lowest salary of department 30.
27. Display all the employees who do not manage anyone.
28. Find all the employees who have the same job as 'RAM'.
29. List the average salary for each department. Then find out the employees who are getting more than that average salary.
30. Display all the employees who working in same department on same post where SMITH is working.
31. Write a PL/SQL block to raise the salary of all managers by 2000 and 1200 for all clerks.
32. Write a PL/SQL block to Demonstrate Trigger.
33. Write a PL/SQL block to Demonstrate Cursor.

BCA 209 PROGRAMMING C++ LAB

1. Create three overloaded function named area for calculating area of circle, triangle, with two arguments, triangle with three arguments.
2. Write a program that swaps two nos using call by reference.
3. Create a matrix class with following functions.
4. create matrix dynamically.
5. Print matrix.
6. Addition.
7. Multiplication
8. Check matrix is unit matrix or not.
9. Create employee class with four constructors including copy constructor.
10. Write a program that clearly shows use of static member and static function.
11. create string class with following
12. function that creates string dynamically.
13. Three overloads constructors.
14. Functions to join, copy, compare two strings.
15. Overload following operators for matrix class.

- + =
- = =
- + +
- ~
- –(unary minus).

16. Write a program to implement hybrid inheritance.
17. Implement link list in c + + with following functions.
18. create liked-list.
19. Insertion after and before a particular node.
20. Delete a particular node.
21. Print
22. Reverse linked-list.
23. Implement stack and make PUSH and POP function of STACK.

BCA 210 8085 MICROPROCESSOR LAB

1. Write a program to find the Sum of a series of 8 bit numbers.
2. write a program to find the sum of two 16 bit numbers.
3. write a program to find 2's complements of 16 bit numbers.
4. write a program to mask off least/ most significant 4 bit of an 8 bit no.
5. write a program to find the smallest of the series of 8 bit numbers.
6. write a program to find the largest of the series of 8 bit numbers.
7. write a program to to arrange a series of 8 bit numbers into ascending order/ descending order.
8. write a program to find the product of 8 bit * 8 bit numbers.
9. write a program to divide an 8 bit number by an bit number.
10. write a program to find square root of a perfect / imperfect 8 bit number

BCA THIRD YEAR

BCA 301 JAVA PROGRAMMING

C++ Vs JAVA, JAVA and Internet and WWW, JAVA support systems, JAVA environment.
JAVA program structure, Tokens, Statements, JAVA virtual machine, Constant & Variables, Data Types, Declaration of Variables, Scope of Variables, Symbolic Constants, Type Casting.

Operators : Arithmetic, Relational, Logical Assignments, Increment and Decrement, Conditional, Bitwise, Special, Expressions & its evaluation.
If statement, if…else… statement, Nesting of if…else… statements, else…if Ladder, Switch, ? operators, Loops – While, Do, For, Jumps in Loops, Labelled Loops.

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

Arrays: One Dimensional & two Dimensional, strings, Vectors, wrapper Classes, Defining Interface Extending Interface, Implementing Interface, Accessing Interface Variable, System Packages, Using System Package, Adding a Class to a Package, Hiding Classes.
Creating Threads, Extending the Threads Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the Runnable Interface.

Local and Remote Applets Vs Applications, Writing Applets, Applets Life Cycle, Creating an Executable Applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, Passing Parameters to Applets, Aligning the Display, HTML Tags & Applets, Getting Input from the User.

BCA 302 MULTIMEDIA TOOLS

Multimedia: Needs and areas of use, Development platforms for multimedia – DOS, Windows, Linux. Identifying Multimedia elements – Text, Images, Sound, Animation and Video, Making simple multimedia with PowerPoint. Text – Concepts of plain & formatted text, RTF & HTML texts, using common text preparation tools, Conversion to and from of various text formats, using standard software, Object Linking and Embedding concept, Basics of font design, overview of some fonts editing and designing tools, Understanding & using various text effects.

Images – importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera etc. various attributes of Images – size, color, depth etc, Various Image file format – BMP, DIB, EPS, CIF, PEX, PIC, JPG, TGA, PNG and TIF format – their features and limitations, graphic file formats conversions, processing images with common software tools such as Photoshop, Paint Shop pro, Corel draw etc..

Sound: Sound and it Attributes, Mono V/s Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sounds-Sampling, Frequency, Sound Depth, Channels, Sound on PC, Sound standards on PC, Capturing and Editing sound on PC, Overview and using

some sound recording, editing software. Overview of various sound file formats on PC – WAV, MP3, MP4, Ogg Vorbose etc.

Animation: Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software-animation pro, 3D studio & Paint Shop pro animator.
Animation on the Web – features and limitations, creating simple animations for the Web using GIF Animator and Flash.

Video: Basics of Video – Analog and Digital Video, How to use video on PC. Introduction to graphics accelerator cards, DirectX Introduction to AV/DV and IEEE1394 cards , Digitization of analog video to digital video, Interlacing and non-interlacing, Brief note on various video standards – NTSC, PAL, SECAM, HDTV, Introduction to video capturing Media & instrument – Videodisk, DVCAM, Camcorder, Introduction to digital video compression techniques and various file formats – AVI, MPEG, MOVE Real Video.
Multimedia on the Web: Bandwidth relationship, broadband technologies, Text in the web – Dynamic and embedded font technology, Audio on the Web – Real Audio and MP3/MP4, Audio support in HTML, Graphics – HTML safe color palate, Interlaced V/s Non interlaced model, Graphics support in HTML, Image Map, Video on the Web – Streaming video, Real Video, MPEG and SMIL, Virtual Reality on the Web.

BCA 303 COMPUTER NETWOKS

Principles o Data Communication: General features and tasks of a communication system, The need for modulation, theory of amplitude modulation, general principles of frequency modulation and phase modulation, Evolution of computer networks, elements of LAN, WAN, MAN

Networking Architecture: ISO-OSI, IBM SNA architecture, their functions and implementation. Concepts of circuit switching, packet switching and network switching. Introduction to serial communication standards and parallel communication interfacing.

Data communication concepts: Types of signals encoding and decoding techniques, signal bandwidth requirements, signal formats used in LAN., switching and broadcast techniques, modulation, multiplexing, switching, network protocols.

Error detection and correcting codes: Hamming codes, parity generation and detection, single error detection and correction, double correction codes. CRC
Transmission media, twisted pair, coaxial cable, optical fibre.

LAN topologies: STAR, BUS and RING network
LAN access techniques: ALOHA, CSMA, token ring and token bus.
Issues related with network reliability and security.

BCA 304 WEB TECHNOLOGY

Overview of ASP.NET framework, Understanding ASP.NET Controls, ApplicationsWeb servers, installation of WS.Web forms, web form controls -server controls, client controls, web forms& HTML, Adding controls to a web form ,Buttons, Text Box, Labels,Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project.

Form Validation: Client side validation, server Side validation, Validation Controls: Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.State management-View state, Session state, Application state.

Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, Data Adapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications: Data Binding concept with web, creating data grid, inding standard web server controls. Display data on web form using Data bound controls.

Writing datasets to XML, Reading datasets with XML. Web services: Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web service, Web Application deployment.

Overview of C#, C# and .NET, similarities & differences from JAVA, Structure of C# program.Language features: Type system, boxing and unboxing, flow controls, Classes, interfaces, Serialization, Delegates, Reflection.

BCA 305 SYSTEM ANALYSIS AND DESIGN

System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, man-made information systems.
System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success.
System Planning: Base for planning a system, Dimensions of Planning.

Initial Investigation: Determining users requirements and analysis, fact finding process and techniques.
Feasibility study: Determination of feasibility study, Technical, Operational & Economic Feasibilities, System performance constraints, and identification of system objectives, feasibility report.
Cost/Benefit Analysis: Data analysis, cost and benefit analysis of a new system. Categories determination and system proposal.

Tools of structured Analysis: Logical and Physical models, context, diagram, data dictionary, data diagram, form driven methodology, IPO and HIPO charts, Gantt charts, system model, pseudo codes, Flow charts-system flow chart, run flow charts etc., decision tree, decision tables, data validation,
Input/ Output and Form Design: Input and output form design methodologies, menu, screen design, layout consideration.

Management standards – Systems analysis standards, Prgramming standards, Operating standards.

Documentation standards – User Manual, system development manual, programming manual, programming specifications, operator manual.
System testing & quality: System testing and quality assurance, steps in system implementation and software maintenance.
System security: Data Security, Disaster/ recovery and ethics in system development, threat and risk analysis.

BCA 306 COMMUNICATION SKILLS

ORIENTATION
Concept of Motivation
Types of Motivation
People Skills
General Awareness
MEMORY MANAGEMENT
Memory and Retention Techniques
Mind Mapping
Reading Skills
Listening Skills
Revision Techniques
Examination Skills
COMMUNICATION EFFECTIVENESS
Fluency Enhancement
Removal of barriers to communication
Group Discussion
Role Play
Anchoring
Voice Modulation Management
COMPREHENSIVE COMMUNICATION
Principles of Communication
Art of effective Public Speaking
Written Communication Skills
Principles of Effective Writing
Reading Habit Development
Oral Presentation Skills
PRESENTATION SKILLS
Techniques of Presentation
Methods of preparing Presentation
Removal of stage fear
Tools of Presentation (Transparencies, Slides & Audio-Visual Tools)

BCA 307 JAVA PROGRAMMING LAB

NOTE: All programs should be done using DOS editor

1. write a program that products the following output:-

Hello World
This Is Java.
Good Buy.

2. Write a program that prints all integer between 0 and 36.
3. Create an array of 4 random numbers.
4. Generate Fibonacci series up to 10 numbers.
5. Write a program to calculate income tax for the given income of user as per rules.
6. Write a program that reads two numbers from command line and print all the prime numbers between them.
7. Write a program that prints command line arguments in reverse order.
8. Write a program that reads two numbers from the command line, the number of hours worked by an employee and their basic pay rate. Then output the total pay due. Add warning messages to the payroll program if the pay rate is less then the minimum wage($ 4.35 an hour as of mid 1996) or if the employee worked more then the number of week.
9. give your circle a getarea method that calculates its area, and a printinfo method that prints out the radius and area. Make a test case that tries capabilities out.
10. make a program that create an array of 10 circle, each with a random radius. Print out the sum of area of the 10 circles. Also print the biggest and smallest areas.
11. create a rectangle class that contains width and height fields also give it a getarea method again. Make a few test cases.
12. create a square class with width and getarea. Then, give both square and circle setarea methods that let you specify a desire area. Make a few test cases.
13. Write an application program in Java to implement the different uses of static keyword.
14. Write an application program in Java to implement the different uses of final keyword.
15. Write an application program in Java to implement the different uses of super keyword.
16. write a program to demonstrate multiple inheritance using interface.
17. write a program to demonstrate multi threading in JAVA.

BCA 308 ASP .NET LAB

1. Design a web form using HTML controls and change the controls properties.
2. Design a form to create account in website using following fields
    - First name
    - Last name
    - Username
    - Password
    - Confirm Password
    - Gender
    - Birthday
    - Mobile Number
    - Security Question
    - Answer
    - Location
    - Terms and condition

3. Validate the account form using validation control
    - Required field Validation
    - Range Validation
    - Compare Validation
    - Regular Expression Validation

- Summary Validation

4. Design multiform web project with following menus.
   - Home
   - Courses
   - Departments
   - Staff profile
   - Alumni
   - Downloads

5.Write a program to retrieve data from one web form and display it to another web form.

6.Design a web form using calendar control and display the monthly events(holidays).

7.Design a web form using Adrotator control and display advertisements on form.

8.Design a webform using Navigation Controls.

9. Design a web form using File Upload control.

(I) Write the code to save the file in to the uploads folder.

(II) Write the code to display the information of uploaded file.
   - Name of file
   - Type of file
   - Size of file

10.Design a web form using Image Map and redirect form using following:

   - Navigate
   - PostBackUrl

11.Design a web form using following controls:
   - Wizard control.
   - Panel Control
   - Multiview Control

12.Create a XML file and display its data on web form.

13.Create a database college and create following tables:
Login
Department
Staff
Student

14.Create a program to connect the web form to Database College.

BCA 309 PROJECT WORK

BCA 310 SEMINAR