BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)

Structure for B.C.A. – CBCS Programme

Semester-I (FY)

COURSE	COURSE TYPE	SUBJECT	CREDIT
BCA-EC-101	ELECTIVE	Environmental Science - I	02
BCA-FC-102	FOUNDATION	Introduction to English Language and Literature - I	02
BCA-CC-103	CORE	Fundamental of Computer Organization	03
BCA-CC-104	CORE	Introduction to Programming (C Language)	03
BCA-CC-105	CORE	RDBMS-I	03
BCA-CC-106	CORE	Mathematics	03
BCA-CC-107	CORE	Practical (Based on BCA-CC-104 & BCA-CC-105)	12
		TOTAL	28

B.C.A. Course: Fundamental of Computer Organization Course No: BCA-CC-103
Semester: 01 Type of Course: Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 Marks
Credits: 03 Theory Sessions per Week: 03 Teaching Hours: 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Basics of Computer	12	18
	- Introduction: Block diagram of a computer, characteristics of computer - Generation of computer: First, Second, Third, Fourth and Fifth Classification of Computer system: Mini Computers, Micro Computers, Mainframe computer, super computer. - Uses and Application of Computer - Basics of Windows: Desk top, file, folder, icon, Windows explorer, and Control panel, Recycle bin, etc.		
Unit-2	Input/ Output Devices and Storage Device	11	18
	- Input Devices: Key board, mouse, and touch panel. - Display Devices: LCD and LED Monitors, Touch Screens - Printer and Scanner: Dot matrix, Line, Drum, Ink Jet, Laser, scanner. - Magnetic storage & Hard Disk, Optical storage technology, CDs, DVDs. Flash memory, Memory stick (pen drive)		
Unit-3	Data Representation and Number Systems	11	17
	- Representation: Representation of Number, Binary, Octal, Hexadecimal number and its arithmetic. - Representation of Integers, Representation of Fractions, Representation of Character, Characters codes (ASCII, EBCDIC, UNICODE) - Binary arithmetic's: Binary addition and subtraction. Binary Multiplication and Division with the help of long-hand method. - Conversion of Numbers: Conversation of number in Decimal, Binary, Octal, Hexadecimal.		
Unit-4	Processors, Memory, port and Computer buses	11	17
	- CPU organization: Registers, ALU, and Control Unit, execution of instruction Primary Memory: RAM, ROM, Types of RAM and ROM - Cache Memory : L1 cache and L2 cache - Port: Parallel Port, Serial Port, USB Port and SCSI Port - Introduction to buses, Read and write cycle, introduction to FSB, PCI Bus and USB.		

Reference Books

1. Tanenbaum A. S.: Structured Computer Organization, Prentice-Hall of India Pvt. Ltd.
2. V. RajaRaman: Fundamentals of Computers
3. Alexis Leon, Mathews Leon: Information Technology

MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY
(With effect from Academic Year: 2019-20)

B.C.A.	Course: Introduction to Programming (C Language)	Course No: BCA-CC-104
Semester: 01	Type of Course: Core Course	
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 Marks		
Credits: 03	Theory Sessions per Week: 03	Teaching Hours: 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Programming Language Fundamentals	12	18
	- Flowchart and Algorithm - Introduction to programming language and types of programming language - Concept of Editor, Compiler, Interpreter, Translator, Assembler - Getting started with C:Histroy, Structure of C program, Compilations & linking C program - Character Set, Keywords, Identifier, Data Type, Variable and Constant		
Unit-2	Programming Constructs	11	18
	- Formatted Input and output statements - Operators - Decision making and Branching (If, if-else, switch etc) - Looping construct (While loop, Do..While loop, For loop etc) - Break, Continue, go to and exit		
Unit-3	Array, sorting searching technique, character and string handling	11	17
	Introduction of array Declaration and initialization of 1-D and 2-D arrays Programming using 1-D and 2-D Array Sorting method(selection, bubble), Searching method (linear, Binary) Declaration and initialization of string and character data Character and string operation Character and String handling Function		
Unit-4	Functions	11	17
	Concept of modular programming Elements of function, Type of Function Declaration, Calling, and Defining a function. Passing Array and string as function argument Built-in Function: math's, input output function etc		

Reference Books

1. Programming in ANSI 'C' – Balaguruswamy: TMH.
2. Let Us C By Yasvant Kanitkar
3. Mulish Cooper : The Spirit of C, Jaico Pub. House, 19th Edition-1999

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(With effect from Academic Year: 2019-20)

B.C.A.	Course: RDBMS-I	Course No: BCA-CC-105
Semester: 01	Type of Course: Core Course	
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 Marks		
Credits: 03	Theory Sessions per Week: 03	Teaching Hours: 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit 1	Introduction to database	12	18
	- Basic concepts – Data, Information, Database, DBMS - Overview of RDBMS – Tables, records (rows) & fields (columns) - Applications of RDBMS. - Theoretical concepts – Entity, attribute, Tuple, Domain Set, Relationship between entities, E-R Diagrams, Normalization - Dr. Codd's 12 rules		
Unit 2	Basic elements of database and Detailed look on Queries in open office.	11	18
	- Creating a table, various data types, other properties of field - Creating form and report using single table - Modifying form and report layout - Select queries – By Design and SQL statement – on single table - Select queries based on multiple tables (rigorous practical exercises to be covered) - Insert, Update & Delete queries – Design, SQL statements, execution, How they differ from select query - Advanced query building - Automating Tasks using Macro		
Unit 3	Electronics Spreadsheet as database in open office	11	17
	- Introduction to spreadsheet : Opening Spreadsheet, Menus - main menu, Toolbars, Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells - Entering the data in tabular form, inserting / deleting of rows and columns - Using formula in columns - Database operations: Sorting, Filtering, Consolidation, and Subtotal.		
Unit 4	Importing & Exporting Data in open office	11	17
	- Importing Data from text file, XML file, Spreadsheet file - Exporting Data to text file, XML file, Spreadsheet file - Managing Database – Taking Backups & Repair Database		

Reference / Text-Books / Additional Reading :

1. Desai Bipin C: Introduction to database Systems, West Publishing Co.
2. A conceptual guide to open office.org3 R. Gabriel Gurely

B.C.A.	Course: Practical	Course No: BCA-CC-107
Semester: 01	Type of Course: Core Course	
Marking Scheme: External Examination: 100 + Internal Evaluation: 00 = 100 Marks		
Credits: 12	Practical Sessions per Week: 12	Teaching Hours:180 Hours

Unit	Detailed Syllabus	Marks/ Weight
Unit-1	Practical Problem from BCA-CC-104	50
Unit-2	Practical Problem from BCA-CC-105	50

Structure for B.C.A. – CBCS Programme

Semester-II (FY)

COURSE NO.	COURSE TYPE	SUBJECT	CREDIT
BCA-EC-201	ELECTIVE	Environmental Science – II	02
BCA-FC-202	FOUNDATION	Introduction to English Language and Literature - II	02
BCA-CC-203	CORE	Information Technology in Business	03
BCA-CC-204	CORE	Web Designing	03
BCA-CC-205	CORE	Advanced C Programming	03
BCA-CC-206	CORE	Statistics	03
BCA-CC-207	CORE	Practical (Based on BCA-CC-204 & BCA-CC-205)	12
		TOTAL	28

B.C.A.	Course: Information Technology in Business	Course No: BCA-CC-203
Semester: 02	Type of Course: Core Course	
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 Marks		
Credits: 03	Theory Sessions per Week: 03	Teaching Hours: 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Information System and Functional Business System	12	18
	- Information Systems and Technologies - Importance of Information Systems in Businesses - Components of an Information System - Information System Resources – people, hardware, software, data, network - Gaining strategic advantage through IT - Managerial Challenges of IT - Introduction to Information Systems: - Manufacturing, Marketing, Accounting, Human Resources Management, Financial Management, Inventory Management. - Introduction to Enterprise Resource Planning. - Enterprise Applications:-Enterprise Resource Planning, - Supply Chain Management, Customer Relationship Management		
Unit-2	Introduction to E-Commerce	11	18
	- Definition, communication perspective, Business Process Perspective, Service Perspective - Classification by nature of transaction : B2B, B2C, C2C, C2B, Non Business EC, Intra-Business EC - Classification of EC Applications: Electronic Market, Inter Organizational System, Customer Services - Benefits to Organizations, Consumers and Society - Limitations of EC, Framework of EC, Future of EC		
Unit-3	E-Commerce Business and Electronic Market Places	11	17
	- Introduction, Eight Key Ingredients of a Business Model, Major B2C and B2B Business Models, Introduction to M-Commerce. - Market space Components, Types of Electronic Markets (Electronic Storefronts, Electronic Malls, Types of Stores and Malls) - Portals and their types, Role of Intermediaries in E-markets, E-market Success Factors, Competitive Factors, Impact of E-Market on Organizations (Marketing, HR, Manufacturing, Finance and Accounting)		
Unit-4	Customer Relationship Management (CRM)	11	17
	- CRM : Meaning, types of CRM, Benefits and Limitations of CRM, Issues in CRM Implementation, Classifications of CRM, Applications, One-to-One Marketing (Personalization, Collaborative Filtering, Customer Loyalty, Trust)		

Reference Books
1. O'Brien J. : Management Information Systems, Tata McGraw-Hill, 2004 2. Jessup L., Valacich J. : Information Systems Today – Why IS Matters, Pearson Education, 2006 3. Electronic Commerce: A managerial Perspective Efraim Turban, Jae Lee, David King, H Michael Chung (Pearson Education.) 4. E-Commerce – Business, Technology, Society Kenneth C Laudon, Carol Guercio Traver (Pearson Education)

B.C.A.	Course: Web Designing	Course No: BCA-CC-204
Semester: 02	Type of Course: Core Course	
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 Marks		
Credits: 03	Theory Sessions per Week: 03	Teaching Hours: 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Internet Fundamental	12	18
	Basic concept of Internet, Intranet and Extranet, Internet Applications (WWW,E-mail, FTP & FTP Commands, IRC ,Web Chat, BBS, News Group, UseNet, NetMeeting) Email Protocol (SMTP, POP, IMAP) Introduction to TCP/IP, DNS, Search Engine and it's working. Overview of Internet Security (Firewall and SSL)		
Unit-2	HTML and DHTML	11	18
	Introduction to HTML Formatting of Text Hyperlinks, working with images, Image Map, List, Tables and Frame Working with Form (GET-POST Methods) and Form Tags. Various Forms Controls		
Unit-3	DHTML	11	17
	Introduction to style sheet and <STYLE> Font Attributes, color Attributes, Text Attributes, Border Attributes, Margin Attributes, List Attributes Working with class, Implement external style sheet and Tags		
Unit-4	JavaScript and CSS	11	17
	Introduction of JavaScript, Variable and data types of JavaScript Decision Making statements , Control structure , Operators of Java Script, Handling event by using Java Script, Message Box in Java Script(Confirm, Alert, Prompt) Validation using Java Script, Built in Objects (String, Math, and Date) Introduction, Syntax structure, selectors, background, text, fonts, link, lists , tables, border, outline, margin, padding, align, navigation bar, image gallery, image opacity, etc		

Reference Books

1. Douglas Comer:- Internet - An Introduction Prentice-Hall of India Pvt. Ltd
2. Ivan Bayross:- WEB enabled Comm. Appli. Develop. using HTML, DHTML, JAVASCRIPT
3. Thomas A. Powell:- The Complete reference HTML and CSS
4. Danny GoodMan:- Java Script Bible

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(With effect from Academic Year: 2019-20)

B.C.A.	Course: Advanced C Programming	Course No: BCA-CC-205
Semester: 02	Type of Course: Core Course	
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 Marks		
Credits: 03	Theory Sessions per Week: 03	Teaching Hours: 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Structure and Union	12	18
	Structure Declaration and initialization Creating variable and accessing data members Array within structure and array of structure Structure within structure Union Passing structure and union as function argument		
Unit-2	Pointer	11	18
	Declaration, initialization and arithmetic of pointers Pointer to array and structures Pointers and strings Pointers as function arguments Functions returning pointers		
Unit-3	Dynamic memory allocation and introduction to linked list	11	17
	Introduction to dynamic memory allocation, malloc() and calloc() functions, Introduction to linked list, comparison with array, Creation of singly linked list Various operations on singly linked list Singly circular linked list		
Unit-4	File Management, Pre-processors and Bit-wise operators	11	17
	Introduction to files and its significance File pointer, declaring file pointer Opening and closing a file – fopen(), fclose() Modes to open a text file “w”,”r”,”a”,”w+”,”r+”,”a+”. I/O operations on files, I/O functions : fread(), fwrite(), fscanf(), fprintf(), fgetc(), fputc(), fgets(), fputs(), fseek(), ftell() Introduction to pre-processors : #define, #include Bit-wise operators Applications of bit-wise operators		

Reference Books

1. Programming In ANSI C By E. Balagurusamy, TMH Publication.
2. Understanding Pointers in C By Yashwant Kanitkar, BPB Publication
3. Programming with C, Schaums Series, TMH Publication.

B.C.A.	Course: Practical	Course No: BCA-CC-207
Semester: 02	Type of Course: Core Course	
Marking Scheme: External Examination: 100 + Internal Evaluation: 00 = 100 Marks		
Credits: 12	Practical Sessions per Week: 12	Teaching Hours: 180 Hours

Unit	Detailed Syllabus	Marks/ Weight
Unit-1	Practical Problem from **BCA-**CC-204	50
Unit-2	Practical Problem from **BCA-**CC-205	50

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)

Structure for B.C.A. – CBCS Programme

Semester-III (SY)

COURSE	COURSE	SUBJECT	CREDIT
BCA-EC-301	ELECTIVE		02
BCA-FC-302	FOUNDATION		02
BCA-CC-303	CORE	Operating System	03
BCA-CC-304	CORE	Data and File Structure	03
BCA-CC-305	CORE	Object Oriented Programming with C++	03
BCA-CC-306	CORE	System Analysis and Design	03
BCA-CC-307	CORE	Practical (Based on BCA-CC-304 & BCA-CC-305)	12
		TOTAL	28

MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY
(With effect from Academic Year: 2019-20)

B.C.A. **Course:** Operating System **Course No:** BCA-CC-303
Semester: 03 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 **Credits:** 03
Theory Sessions per Week: 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Basic concept of an operating system**	**12**	**18**
	- Definition and Function of operating systems. - Evolution of operating system: Batch system, Multi programmed system, time sharing and PCs. - Introduction to basic terms & batch processing system: Jobs, Processes files, command interpreter. - Different types of operating system-real time systems, parallel, distributed system. - Operating system structure-monolithic layered, virtual machine & Client server.		
Unit-2	**Process Management**	**11**	**18**
	- Processes: Definition, Process States , Process Control Block ,Context switching. - Process Scheduling: Definition, Scheduling objectives. - Types of Schedulers ,Scheduling criteria : CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition only) , - Scheduling algorithms : Pre emptive and Non , pre emptive , FCFS – SJF – RR		
Unit-3	**Deadlocks and Threads**	**11**	**17**
	- Definition, Deadlock characteristics, Deadlock Prevention. - Introduction of Deadlock Avoidance: banker's algorithm and problem solving, - Deadlock detection and Recovery. - Threads - Concept of multithreads, Benefits of threads – Types of threads.		
Unit-4	**Memory Management – Basic Memory Management and Virtual Memory**	**11**	**17**
	- Definition, Logical and Physical address Map. - Memory allocation: Contiguous Memory allocation – Internal and External fragmentation. - Paging: Principle of operation – Page allocation – Hardware support for paging – Protection and sharing – Disadvantages of paging. - Segmentation. - Introduction to Virtual Memory. - Page Replacement policies, Optimal (OPT) , First in First Out (FIFO), Least Recently used (LRU)		

Reference Books

1. Silberschatz, Galvin and Gange: Operating System Concepts, Wesley.
2. Tanenbaum A.S., "Modern Operating Systems", 4th Edition, PHI, 2001
3. Stalling W, "Operating Systems", 6th edition, Prentice Hall India.

B.C.A. **Course:** Data and File Structure **Course No**: BCA-CC-304
Semester: 03 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 **Credits:** 03
Theory Sessions per Week: 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction to Data Structure and Sorting Techniques**	**12**	**18**
	- Definition of Data Structure, Classification of Data Structure (Linear, Non Linear) - Applications, Aims and Goals of Data Structure, Sparse Matrix. - Representation of Array in Memory: Row-Major and Column-Major order. - Address calculation of elements of one and two-dimensional arrays. - Sorting and Merging Methods: Insertion Sort, Shell Sort, Quick Sort, Merge Sort.		
Unit-2	**Linear Data Structure : Doubly Linklist**	**11**	**18**
	- Introduction to Linked list and its types. - Introduction of Doubly Linked list. - Advantages and Disadvantages of Doubly linked list. - Application of Doubly linked list. - Different between single and double link list. - Operation on Doubly Linked list.(insert, update, delete, display Algorithm and program)		
Unit-3	**Linear Data Structure: Stack and Queue**	**11**	**17**
	- Definition of Stack, Applications of Stack. - Stack Operations using Array (Push, Pop, Peep, Display) - Stack Operations using Linked List (Push, Pop, Peep, Display) (Algorithm and Program of All Stack Operations using Array and Linked List) - Polish Notation: Conversion of Expression (Prefix, Infix, Postfix) (using hand or stack method) - Definition of Queue, Applications of Queue. - Queue Operations using Array (Insert, Update, Delete, Display) - Queue Operations using Linked List (Insert, Update, Delete, Display) (Algorithm and Program of All Queue Operations using Array and Linked List) - Circular Queue using Array. - Concept of Priority Queue and Double Ended Queue.		

Unit-4	Non Linear Data Structure: Tree and Graph	11	17
	- Concept of Binary Tree, Representation of Binary Tree: Sequential and Linked List. - Types of Binary Tree : Strictly, Full, Complete, in complete, - Creation of Binary Tree - Binary Tree Traversal : Pre order, In order, Post order (using recursion) Definition of Graph and its terminologies - Representation of Graph : Adjacency Matrix, Adjacency List Definition of Tree, Basic Tree Terminology (Root, Node, Degree of Node, Degree of Tree, Leaf Node, Non Terminal Node, Siblings, Level of Tree, Edge, Path, Depth, Forest)		

Reference Books

1. Data and File Structure: Trembly & Sorenson.
2. Expert in Data Structure With C: R.B.Patel.
3. Data Structure using C: Aaron M. Tenenbaum.
4. Data Structure through C: G.S.Baluja

B.C.A. **Course:** Object Oriented Programming with C++ **Course No:** BCA-CC-305
Semester: 03 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 **Credits:** 03
Theory Sessions per Week: 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Principal Of Object Oriented Programming**	**12**	**18**
	- Introduction of OOP, OOP V/s POP - Concept of OOP – Object, Class, Inheritance, Encapsulation, Polymorphism, Abstraction, Message Passing - Structure Of C++ Program - Tokens in C++ - Data type, Constant, Variable, Statement & Operators - Function – Member function, Inline function, Friend function - Input/output statements - Declaration & Creation of Class and Object		
Unit-2	**Constructor, Operator overloading and Type conversion**	**11**	**18**
	- Constructor – Types of constructor, characteristics of constructor, constructor overloading. - Destructor - Basic of operator overloading - Types of operator overloading-Unary, Binary - Operator overloading using member function & friend function		
Unit-3	**Type Conversion and Inheritance**	**11**	**17**
	- Type conversion - Categories of type conversion - Basic of inheritance- - Types of inheritance- Single level, multiple, multilevel, hierarchical and hybrid - Constructor in derived class - Concept of Abstract class - Nesting of classes		
Unit-4	**Polymorphism**	**11**	**17**
	- Basic of Polymorphism-Compile time & Runtime polymorphism - This pointer - Pointers to derived classes - Virtual and Pure virtual function - Virtual constructor and destructor		

Reference Books

1. E-Balaguruswami: Object Oriented Programming with C++ Mc Graw-Hill
2. Robert Lafore: Object Oriented Programming with C++ Galgotia Publications.
3. Rajaraman: Object Oriented Programming with C++ New age International

B.C.A. **Course:** System Analysis And Design **Course No:** BCA-CC-306
Semester: 03 **Type of Course :** Core Course
Marking Scheme: External Examination**:** 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit 1	**System Concept**	**12**	**18**
	– Introduction to system – Characteristics and elements of system – Types of system – System analysis – System analyst & its role. – CBIS, Information system and categories of information system. – System users.		
Unit 2	**System Development Strategies**	**11**	**18**
	– Introduction to SDLC – Phases of SDLC – Application of SDLC Method – Limitation of SDLC Method – Introduction to SSADM, Need of SSADM – System survey – Structured analysis – Structured design – Advantages of SSADM – System Prototype Method (SPM)		
Unit 3	**Input/ Output Design & Fact Finding Techniques**	**11**	**17**
	– Input – data capture objectives. – Data verification & Validation – Interactive screen – Output - Design of Output & its Objectives – FFT – Interview, Questionnaire, Record Inspection, Observations.		
Unit 4	**Analysis & Design Tools**	**11**	**17**
	– DFD, Symbols uses in DFD, Physical & Logical Design – Decision table & tree – Data Dictionary – HIPO chart, Warnier/Orr diagrams – Structured English		

Reference Book:

1. James A Senn: Analysis and Design of Information Systems, McGraw Hill Intl. Stdt. Edn
2. S. Parthasarthy & B. W. Khalkar : System Analysis & Design 1st Edition, Master Ed.Cons.
3. Yourdon E. and Constantine L. L : Structured Analysis & Design Yourdon press NY

B.C.A.	**Course:** Practical	**Course No:** BCA-CC-307
Semester: 03	**Type of Course:** Core Course	
Marking Scheme: External Examination: 100 + Internal Evaluation: 00 = 100 Marks		
Credits: 12	**Practical Sessions per Week:** 12	**Teaching Hours:**180 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Practical Based on 304	90	50
Unit-2	Practical Based on 305	90	50

Structure for B.C.A. – CBCS Programme

Semester-IV (SY)

COURSE	COURSE	SUBJECT	CREDIT
BCA-EC-401	ELECTIVE		02
BCA-FC-402	FOUNDATION		02
BCA-CC-403	CORE	Advance Operating System and Intro to Linux	03
BCA-CC-404	CORE	Application Development Using Vb.Net	03
BCA-CC-405	CORE	Web Application Development Using PHP	03
BCA-CC-406	CORE	Object Oriented Analysis and Design	03
BCA-CC-407	CORE	Practical (Based on BCA-CC-404 & BCA-CC-405)	12
		TOTAL	28

B.C.A. **Course:** Advance Operating System and Intro. to Linux **Course No:** BCA-CC-403
Semester: 04 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**File Management and Directory Managment**	**12**	**18**
	– File format, Characteristics of file, File operations, File system structure, – File access methods: Sequential , direct and Index sequential. – Directory structure: single level, two level, tree level , – Directory operations, directory implementation: Linear list, Hash table – Disk Space Allocation Method : Continuous, Linked, Index, Free Space Management.		
Unit-2	**I/O Management**	**11**	**18**
	– Typical PC Bus structure, Pooling and Interrupts, DMA Controller , Kernel I/O Subsystem: I/O Scheduling, Buffering, Caching, Spooling, Error Handling. – Mass Storage Structure and Disk scheduling algorithm (FIFO, SSTF, SCAN, C- SCAN.)		
Unit-3	**Introduction to Unix and Linux Operating System (Open Source)**	**11**	**17**
	– History of Unix Operating System Definition of Kernel, Shell, File, Process, – System Calls., Linux Operating System, Features of Unix and Linux Operating System, Application area of Linux Operating System , Various Linux Flavors, Desktop Environment : (a) X Window Basics (b) KDE Basics (c) GNOME Basics, Advantages and Disadvantages of Linux		
Unit-4	**File Structure and Linux Shells.**	**11**	**17**
	– Understanding File system hierarchy standard, Directory Commands, File and Directory commands, Understanding Job (process). – Process Commands, User commands: Misc Commands, Keyboard commands using ctrl key.		

Reference Books

1. Silberschatz, Galvin and Gange: Operating System Concepts, Wesley.
2. Tanenbaum A.S., “Modern Operating Systems”, 4th Edition, PHI, 2001
3. Stalling W, “Operating Systems”, 6th edition, Prentice Hall India.
4. Sumitabha Das: Concepts and Application of UNIX 4th edition Tata McGraw Hill
5. Yashwant Kanitkar: Unix Shell Programing, BPB Publication

B.C.A. **Course:** Application Development Using VB.NET **Course No:** BCA-CC-404
Semester: 04 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction**	**12**	**18**
	– .Net Framework, Common Language Runtime – Feature & Advantages of CLR. – JIT & It's Types : Pre-JIT, Econo-JIT, Normal-JIT – Introduction to Integrated Development Environment (IDE) – Programming Construct – Variable, Datatype, Type Casting, control structure, looping statement, array, function & procedure, Exception Handling.		
Unit-2	**Basic Controls and Advance Control**	**11**	**18**
	– Introduction of form. – Label, Textbox, Button. – Link Label, Combo box, List box, Checkbox, Radio button, Scrollbar. – Timer Control, Group box, Panel – Event Handling, Method & Property of controls. – MDI & SDI form, Main Menu Strip & Context Menu. – Rich text box, Picture box, Date time Picker. – Track bar, Notify Icon, Progress Bar, Tool tip		
Unit-3	**Dialog Box and Database Connectivity**	**11**	**17**
	– Built In Dialog box (Open File Dialog, Save File Dialog, Color Dialog, Font Dialog, Folder Browser Dialog) – ADO.Net Architecture. – Create database using MS Access and accessing database using server explorer. – Database connectivity using programming code. – Database binding with Data Grid View & combo box. – Crystal Report.		
Unit-4	**Object Oriented Programming**	**11**	**17**
	– Class, Object & it's characteristics – Inheritance, Polymorphism. – Function Overloading – Properties: Read Only Properties, Write Only Properties. – Constructor & Destructor. – Small application development.		

Reference Books

1. Steven Holzner: Visual Basic .NET Programming Black Book DeramTech Press.
2. Rod Stephens: Visual Basic 2005 Programmer's

B.C.A. **Course:** Web Application Development Using PHP **Course No:** BCA-CC-405
Semester: 04 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction**	**12**	**18**
	– Fundamental of webpage, website and apache server – Static and Dyanamic Website – Introduction of PHP-Features, Advantages and Limitations – Data Type, Variable, Constant – Operator in PHP		
Unit-2	**Basic of PHP**	**11**	**18**
	– Conditional Statement – Looping Statement – Array- Types of Array(Numeric, Associative, Multi-dimensional) – PHP Server variables – Built-in-functions: o **String**(print(),echo(),chr(),trim(),ltrim(),rtrim(),soundex() str_word_count(),strcmp(),stristr(),strstr(),strlen(), strpos(),strrev(),substr(),strtoupper(),strtolower(),ucfirst (), ucword(),sucbstr_replace()) o **Mathametical**(abs(),sqrt(),log(),floor(),ceil(),pow(), max(),min()) o **Date/Time**(Date(),time(),getdate(),gettimeofday(), localtime(),checkdate())		
Unit-3	**Working with form , Cookie and Session**	**11**	**17**
	– Form elements- TextBox, TextArea, Password,RadioButton, Check Box, Combo Box, Image – Buttons – Submit and Reset – Uploading File to webserver – POST & GET method – PHP include and require statement – Basic of Cookie-Setting Cookies, Accessing Cookies, Deleting Cookies. – Basic of Session- Starting a Session, Destroying a session.		
Unit-4	**Database Connectivity and Error Handling**	**11**	**17**
	– PHP-MySQL architecture – Database interaction –Creating and connecting database – Executing commands- Selecting, Inserting, Updating, Deleting – Small application development – Error Handling- Try, Catch and Throw block, die() function – Page redirection in PHP		

Reference Books
1. Ivan Bayross,Sharanam Shah:PHP 5.1 For Beginners,Sh off Publishers & Distributors(SPD)
2. Janet Valade: PHP5 & MYSQL Projects,Wiley Dreamtech
3. Dave W. Mercer: Beginning PHP5,Wiley India Edition
4. Steven Holzer:The Complete Reference PHP,Tata McGRAW-HiLL,New Delhi.

B.C.A. **Course:** Object Oriented Analysis and Design **Course No:** BCA-CC-406
Semester: 04 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**SYSTEM DESIGN, SYSTEM TESTING & IMPLEMENTATION**	**12**	**18**
	- Introduction to database? - System development in database environment - Design of database – Normalization - Principles of Software Design - System Testing - Testing Strategies - Types of system testing - Level of Testing - System conversion methods – parallel, direct cut over, pilot & phase-in method.		
Unit-2	**OBJECT ORIENTED MODEL**	**11**	**18**
	- What is object oriented model? - Characteristics of OOM – class & object, Link & association, Generalization & Inheritance. - Benefits of OOM - Introduction to OOA & Advantages & Disadvantages of OOA		
Unit-3	**OBJECT ORIENTED ANALYSIS & DESIGN**	**11**	**17**
	- Analysis Techniques – Object Modeling, Dynamic Modeling & Functional Modeling. - Object design process, steps & solution - Defining classes & its implementation, inheritance, association & object representation. - Breaking system into sub system & managing data store.		
Unit-4	**MODELING & IMPLEMENTATION STRATEGIES**	**11**	**17**
	- Object modeling – identifying object classes, user object model , object modeling notations. - Dynamic modeling – state diagram - Functional modeling – steps of constructing function model, DFD - Structural Diagram – what is structural diagram & class Diagram. - Implementation strategies		

Reference Books

1. James A Senn: Analysis and Design of Information Systems, McGraw Hill Intl. Stdt. Edn
2. Yourdon E. and Constantine L. L : Structured Analysis & Design Yourdon press NY
3. Object Oriented Analysis and Design by James Rumbaugh, Michael Blaha, William Premerlain, Frederick Eddy, William Lorensen

B.C.A.	**Course:** Practical	**Course No:** BCA-CC-407
Semester: 04	**Type of Course:** Core Course	
Marking Scheme: External Examination: 100 + Internal Evaluation: 00 = 100 Marks		
Credits: 12	**Practical Sessions per Week:** 12	**Teaching Hours:**180 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Practical Based on 402	90	50
Unit-2	Practical Based on 403	90	50

Structure for B.C.A. – CBCS Programme

Semester-V (TY)

COURSE	COURSE	SUBJECT	CREDIT
BCA-EC-501	ELECTIVE		02
BCA-FC-502	FOUNDATION		02
BCA-CC-503	CORE	Software Engineering	03
BCA-CC-504	CORE	Web Application Development Using Asp.Net	03
BCA-CC-505	CORE	RDBMS Using Oracle 1	03
BCA-CC-506	CORE	Data Communication and Networking	03
BCA-CC-507	CORE	Practical (Based on BCA-CC-504 & BCA-CC-505)	12
		TOTAL	28

B.C.A. **Course:** IT PROJECT MANAGEMENT **Course No:** BCA-EC-501
Semester: 05 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 02 **Theory Sessions per Week:** 02 **Teaching Hours:** 30 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction AND IT Project**	**8**	**18**
	- Definition of the project - Project specification and parameters. - Goals of IT Project Management. - Project management life cycle - Introduction to types of Project. - Overview of Project Planning. - Project Analysis. - Software Estimation.		
Unit-2	**Activity Planning**	**8**	**18**
	- Project Management Activity. - Project Coast Estimation. - Project Planning. - Project Scheduling.		
Unit-3	**Risk Management**	**7**	**17**
	- Risk Management: Resource Allocation –Monitoring and control. - Team Management. - Role and Responsibilities in Project Team - Project Tracking.		
Unit-4	**Case Study**	**7**	**17**
	- Institute Management System, Inventory - Management System, Hospital Management System, - Hotel Management System, Etc…..		

Reference Books

1. John J. Rakos, “Software Project Management”, 1998, Prentice Hall
2. Walker Royce, “Software Project Management”, 2001, Pearson Education.
3. Roger S. Pressman, “Software Engineering”, 2001, McGraw Hill.
4. Jack T. Marchewka, Information Technology Project Management,4th Edition.
5. Mike Cotterell, Bob Hughes- Software Project Management- McGraw Hill 5th Edition.

MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY
(With effect from Academic Year: 2019-20)

B.C.A. **Course:** Software Engineering **Course No:** BCA-CC-503
Semester: 05 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction, Software Requirement Analysis & Specification**	**12**	**18**
	– Define -Software & Software Engineering – Software Engineering Approach – Phase Development Process, Project Management – Software Process & It's Characteristics – Software Development Process Models – Water Fall Model, Prototyping, Iterative Enhancement, Spiral Model – Define Software Requirements – Need For SRS – Role of SRS Requirement Process -Problem Analysis ,Requirement Specifications, Validation		
Unit-2	**Software Planning & Designing**	**11**	**18**
	– Team Structure – Egoless team, Chief Programmer Team, Controlled Decentralized Team – Quality Assurance Plan – Verification & Validation, Inspection & Review – Risk Management – types of risk management – System Design principles. – Module level concepts - Coupling & Cohesion – Design Methodology - Structure Chart – Functional approach vs. Object Oriented Approach		
Unit-3	**Coding & Testing**	**11**	**17**
	– Programming Practice – Testing Fundamentals (errors, fault & failure) – Levels of Testing – Testing Methods		
Unit-4	**UML**	**11**	**17**
	– Fundamental of UML – Associations, Multiplicity, Qualified Association, – Reflexive Association, Inheritance & Generalization, Dependencies – Component of UML – Class Diagram, Object Diagram, Use Case Diagram, Activity Diagram – Case study –Library management system, ticket reservation system, hospital management system.		

Reference Books

1. Pankaj Jalote: An Integrated Approach to Software Engineering, Narosa Publication
2. Joseph Schmuller: Teach Your Self UML in 24 Hours, Techmedia Publication
3. Roger Pressman: Software Engineering, McGraw-Hill Publication
4. Object Oriented Modeling and Designing with UML, Michael R Blaha & James R Rumbaugh - Pearson

MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY
(With effect from Academic Year: 2019-20)

B.C.A. **Course:** Web Application Development Using ASP.NET **Course No:** BCA-CC-504
Semester: 05 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 **Credits:** 03
Theory Sessions per Week: 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction and Basic Controls**	**12**	**18**
	– Introduction of IDE. – Introduction of web forms & Page event life cycle. – Global application class & web.config file. – Advantages and features of asp.net. – State management using view state, query string, session and cookies. – Label, Button and Textbox. – List Controls:Dropdownlist, listbox, checkbox list, radiobutton list,BulletedList. – Radio button, checkbox.		
Unit-2	**Advance controls**	**11**	**18**
	– File upload and Image control. – Hyperlink, table, panel and wizard – Navigation controls using menu, treeview and sitemap path. – Validation Controls – Ad Rotator – Login Controls. – Master Page, Theme and CSS.		
Unit-3	**Working with Database**	**11**	**17**
	– ADO.NET architecture. – Introduction of Server Explorer and its Features. – Create database using sql server express and access with server explorer. – Connectivity using code and sql data source. – Data controls using grid view, form view, det**ails view and data list control.**		
Unit-4	**AJAX & Web services**	**11**	**17**
	– Introduction of AJAX : History, Advantages, Application – AJAX architecture. – AJAX basic controls- ScriptManager, ScriptManagerProxy, UpdatePanel, UpdateProgress and timer. – Introduction of web services. – Create and deploy web services.		

Reference Books

1. ASP.NET Black BOOK Published By Dreamtech Press
2. ASP.NET UNLEASHED By STEPHEN WALTHER

B.C.A. **Course:** RDBMS using Oracle-I **Course No:** BCA-CC-505
Semester: 05 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**DBMS AND RDBMS CONCEPTS & INTRODUCTION TO ORACLE SERVER**	**12**	**18**
	– Overview of DBMS and RDBMS – Three schema Architecture – Data models: Hierarchical Model, Network model, Relational model. – ORACLE Server & Instances – Database Structure & Space Management – Memory & Process Structure – Client Server Architecture – Distributed Database Processing – How Oracle Works		
Unit-2	**BASIC SQL*PLUS**	**11**	**18**
	– Introduction of SQL, Characteristics of SQL. – Basic Data Types of ORACLE, Oracle Operators. – Data Definition Language (DDL) – Data Manipulation Language (DML) – Data Control Language (DCL) – Transaction Processing Language (TPL) – Query Generation using Clause: Where, Between, Distinct, Like, Order by, IN,NOTIN		
Unit-3	**ADVANCE SQL*PLUS-I**	**11**	**17**
	– Data Constrains – Types of Data Constrains. – In Built Functions: Aggregate, Numeric, String, Data/Time, Conversion. – Grouping of Data		
Unit-4	**ADVANCE SQL*PLUS-II**	**11**	**17**
	– Sub queries and Types of Sub queries – Join and types of join – Union, Intersect and minus Clause – Schema and Schema objects: View, Sequence, index, synonyms.		

REFERENCE BOOKS

1. Learn Oracle 8i. By Jose A. Ramalho. Published by:BPB
2. SQL in 21-Days - Techmedia
3. PL/SQL in 21 Days - Techmedia
4. SQL, PL/SQL:THE PROGRAMMING LANGUAGE OF ORACLE By Evan Bayross

B.C.A. **Course:** Data Communication and Networking **Course No:** BCA-CC-506
Semester: 05 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Data Communication Fundamentals**	**12**	**18**
	- Introduction of Ancient, Electronic and Computerized Methods of Communication. - Digital and Analog Data - Data transmission Modes (Simplex, Half Duplex and Full Duplex) - Types of Transmission media: Guided and Unguided - Guided Transmission Media: Twisted Pair, Coaxial Cables, Fiber Optics. - Unguided Transmission Media: Radio Waves and Micro Waves		
Unit-2	**Introduction to Computer Network , Local Area Network Technology and Networking Devices**	**11**	**18**
	- Meaning of the basic terms: – Network, Internetwork, Protocol. - Types of Connection (Point to Point and Multipoint.) - Types of Computer Network (LAN, MAN, WAN). - Different types of Server: File Server, Application Server, Mail Server, Web Server, Database Server - Introduction and Characteristics of LAN. - LAN Topologies : Bus, Ring, Star, Tree, Mesh - Functions of Various Networking Components: Repeater, Hub, Switch, Router, Bridge, and Gateway		
Unit-3	**Network Model**	**11**	**17**
	- Switching Technique: Circuit, Packet, and Message Switching - Layered Tasks: Sender, Receiver. - OSI Reference Model. - Connection Less Vs Connection Oriented, Reliable Vs Unreliable Connections - IP Packet Format and IP Addressing(IPV4)		
Unit-4	**Network Applications**	**11**	**17**
	- Domain Name System: DNS Basics, Characteristics, Working Of DNS, DNS Hierarchy. - File Transfer Protocol: FTP Basics, FTP Modes, FTP Commands. - Email: Email Basics, Email Structure, How Email Works? - Email Protocol :SMTP,IMAP, MIME and POP - HTTP Protocol & UDP Protocol.		

Reference Books

1. Data Communication and Networking, Author – Satish Jain / M. Jain, ISBN – 81-7656-484-2, BPB Publication.
2. Data Communication and Networking, Author – Behrouz Forouzan, Tata McGraw Hill Publication

B.C.A.	**Course:** Practical	**Course No:** BCA-CC-507
Semester: 05	**Type of Course:** Core Course	
Marking Scheme: External Examination: 100 + Internal Evaluation: 00 = 100 Marks		
Credits: 12	**Practical Sessions per Week:** 12	**Teaching Hours:**180 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Practical Based on 504	90	50
Unit-2	Practical Based on 505	90	50

Structure for B.C.A. – CBCS Programme

Semester-VI (TY)

COURSE	COURSE	SUBJECT	CREDIT
BCA-EC-601	ELECTIVE	Multimedia & Application	02
BCA-FC-602	FOUNDATION		02
BCA-CC-603	CORE	Network Security	03
BCA-CC-604	CORE	Core Java	03
BCA-CC-605	CORE	RDBMS Using Oracle -II	03
BCA-CC-606	CORE	Project Work	03
BCA-CC-607	CORE	Practical (Based on BCA-CC-604 & BCA-CC-605)	12
		TOTAL	28

MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY
(With effect from Academic Year: 2019-20)

B.C.A. **Course: Multimedia & Application** **Course No: BCA-EC-601**
Semester: 06 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 02 **Theory Sessions per Week:** 02 **Teaching Hours:** 30 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Multimedia- the Concept.**	**8**	**18**
	Introduction Multimedia Definition and Main properties of multimedia system Combination of media Use of multimedia in Education, Entertainment, Advertisement, etc.		
Unit-2	**Components of Multimedia-1 (Text and Graphics)**	**8**	**18**
	Text Images and File Format Graphics and File Format - Basic concept, Digital image representation		
Unit-3	**Components of Multimedia-2**	**7**	**17**
	Digital Audio - Basic sound concept, representation of sound, audio formats Basic concept of Video Signal representation and Computer video format - Basic concept of animation and languages		
Unit-4	**Data Compression AND Multimedia Applications**	**7**	**17**
	Compression technique JPEG MPEG Storage Media Application of multimedia General Design Issues Planning of multimedia Design of Multimedia		

Reference Books

1. Multimedia: Computing, Communications and Application by Ralf Steinmetz and Klara Nahrshedt (Pearson Education Asia)

B.C.A. **Course:** Network Security **Course No:** BCA-CC-603
Semester: 06 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Network Security Fundamental.**	**12**	**18**
	- Concept of Computer Security, Challenges of Computer Security. - The OSI Security Architecture. - Types of Security Attacks: Active Attacks and Passive attacks - Security Services: Authentication, Access Control, Data Confidentiality, and Data Integrity. - A Model for Network Security.		
Unit-2	**Cryptography**	**11**	**18**
	- Concept of Cryptography. - Basic terms: Cryptography, Plaintext, Cipher text, Cipher, Key, Encryption and Decryption. - Cryptography Keys: Public Key and Private Key - Types of Cryptography: Symmetric key, Asymmetric key Cryptography. - Symmetric Cryptography: Substitutuonal and Transposition Cipher.		
Unit-3	**Network Device Securities and E-Mail**	**11**	**17**
	- Switch. - Router. - Network Management System. - Administrative Practice. - Centralize Account Management.		
Unit-4	**IP Security, Firewall and IP Security**	**11**	**17**
	- E-mail Security: S/MIME. - IP Security Overview. - IP Security Architecture. - Application and Benefits of IP Security. - IP Security Services. - Firewall: Introduction, Need for Firewall, Characteristics. - Types of Firewall. - Introduction to Virtual Private Network. - VPN Protocol. - Introduction to Wireless Network Security		

Reference Books

1. Cryptography and Network Security, - William Stallings Person – Printice Hall Publication
2. Data Communication and Networking, - Author – Behrouz Forouzan, Tata McGraw Hill Publication

MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY
(With effect from Academic Year: 2019-20)

B.C.A. **Course: Core Java** **Course No:** BCA-CC-604

Semester: 06 **Type of Course :** Core Course

Marking Scheme: External Examination: 70 + Internal Evaluation : 30 = 100

Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	**Introduction to Java**	**12**	**18**
	- History of Java, Features of Java, Applications of Java, Java Virtual Machine (JVM) and Byte Code, Buzz Words. - Basics Concept of OOP: Abstraction and Encapsulation, Inheritance and Polymorphism - Comparison Between C++ and Java. - Data types, Operators. - Control Statement, Array, and command line argument. - Structure of Java Programming.		
Unit-2	**Programming in Java**	**11**	**18**
	- Classes, Objects and Methods. - Polymorphism: Method Overloading. - Constructor: Concept of Constructor, Types of Constructor, Constructor Overloading. - Garbage Collection, Finalize() Method. - The 'this' keyword. - 'static' and 'final' keyword. - Access Control: Public, Private, Protected, Default.		
Unit-3	**Inheritance and Packages**	**11**	**17**
	- Inheritance Basic, Types of Inheritance. - Uses of 'super' keyword. - Method Overriding. - Run Time Polymorphism: Dynamic Method Dispatch. - Abstract Method and Class. -'final' Keyword with Inheritance. - Defining Package, Understanding of CLASSPATH. - Importing Packages. - Access Protection		
Unit-4	**Interface , Exception Handling and Multi Threading Programming**	**11**	**17**
	Interfaces: Defining Interface, Implementing Interface. - Implementation of Multiple and Hybrid Inheritance using Interface. - Extending Interface - Exception Handling Fundamentals, Types of Exceptions. - Try…catch Keyword, Multiple Catch Statements. - Throw, Throws, Finally Keywords. - Concept of Multi Threading, Thread Life Cycle. - The main Thread. - Creating Thread, Multiple Thread - Thread Priorities.		

Reference Book

1. Complete Reference Java by Herbert Schildt Publisher:TMH
2. Programming in JAVA by E-Balaguruswami
3. Java Programming Reference by Grant Palmer.

B.C.A. **Course:** RDBMS using Oracle-II **Course No:** BCA-CC-605
Semester: 06 **Type of Course :** Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation : 30 = 100
Credits: 03 **Theory Sessions per Week:** 03 **Teaching Hours:** 45 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
UNIT-1	**Basic PL/SQL Programming**	**12**	**18**
	- PL/SQL Block Structure - Control Structure - Implicit Cursor Programming - Explicit Cursor Programming - Parameterize Cursor and Cursor For loop		
UNIT-2	**Advance PL/SQL Programming**	**11**	**18**
	- Exception Handling - Stored Procedure and Function - Trigger - Data Concurrency and locking - Package		
UNIT-3	**INTRODUCTION TO DBA and DBA Activity**	**11**	**17**
	- Role of DBA. - Users: Creating a new user, grant command, deleting user. - Privileges: System privileges, object privileges, Assigning object privileges to a user, Viewing User & privileges, revoking a system & an object privileges. - Role: Creating a role, Granting privileges & roles to a role, granting role to a user, viewing the role of a user. - Database Backup and Recovery - Types of Failure - Data structure used for Database recovery Import and export		
UNIT-4	**Data warehousing and Data Mining**	**11**	**17**
	- Data ware housing Definition, usage and trends - DBMS vs. data warehouse, Data marts, Metadata - Data warehouse architecture - Design and construction of data warhouse - Introduction to data mining - Classification and Applications of data mining system		

REFERENCE BOOKS

1. Data Warehousing, Data Miniing and OLTP; Alex Berson, 1997, McGraw Hill.
2. Learn Oracle 8i. By Jose A. Ramalho. Published by:BPB
3. SQL in 21-Days - Techmedia
4. PL/SQL in 21 Days - Techmedia
5. SQL, PL/SQL:THE PROGRAMMING LANGUAGE OF ORACLE By Evan Bayross

B.C.A. **Course:** Project Work **Course No:** BCA-CC-606
Semester: 06 **Type of Course** : Core Course
Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100 **Credits:** 03

Detailed Syllabus

The objectives of the project is to help the student develop the ability to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and small business solution.
Internal Evaluation scheme: 30 Marks
Submission of project proposal
Progress Report every month (3 Progress Report)
Term End Evaluation 70 Marks:
PROJECT REPORT EVALUATION – 30 MARKS
ACTUAL PROJECT EVALUATION AND VIVA – 40 MARKS

Preparing project report
Student have to prepare project report according given suggestive structure of project report.

Title page
Certificate of work
Acknowledgment
Table of content
Table of Figures

Chapter-1 (Introduction)
- Background, Objective, purpose , scope , applicability

Chapter-2 (Requirement And Analysis)
- Problem definition, Requirement specification, Hardware Software Requirement.
- Planning and Scheduling

Chapter-3 System design
- Over all System design using designing Tools
- Data Dictionary
- Input /Output Design

Chapter -4 Testing and implementation
- Testing Approach used
- Test cases
- Implementation Approaches

Chapter-5
- Conclusion
- Limitation of system
- Future Scope of system
- Bibliography

Student have to prepare 2 – copies of report , 1st copy has to submit in college for evaluation (must be in hard binding) and 2nd copy for personal reference.

B.C.A.	**Course:** Practical	**Course No:** BCA-CC-607
Semester: 06	**Type of Course:** Core Course	
Marking Scheme: External Examination: 100 + Internal Evaluation: 00 = 100 Marks		
Credits: 12	**Practical Sessions per Week:** 12	**Teaching Hours:**180 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weight
Unit-1	Practical Based on 602	90	50
Unit-2	Practical Based on 603	90	50