



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

**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



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

**B.C.A.**  
Semester – I

**Paper EC: 101**

Title of the Paper: **Environmental Science – I**

Credits: **02**

Marks: Semester End Internal Examination: **100 Marks**

Examination: **Internal evaluation**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
1	<b>Natural resources</b> - Introduction - Types of natural resources a. Renewable and b. non renewable resources - Natural resources and associated problems. - <b>Renewable resources -1 : Forest</b> Forest types in India Deforestation Forest functions Threats to the forest in India - <b>Renewable resources-2: Water</b> Over-utilization and pollution of surface and Undergroundwater. Effect of Global climate change on water managment. Water for agriculture and power generation. Sustainable water management.	12	25
2	- <b>Renewable resources- 3: Energy</b> Hydroelectric power, Solar energy Biomass energy, Wind power Tidal and wave power Nuclear power Energy conservation	12	25
3	<b>Ecosystem</b> Producers consumers and decomposers Foodchain food webs and ecological pyramids Forest ecosystem Desert ecosystem Aquatic ecosystem Fresh water and Marine ecosystem	12	25
4	<b>Biodiversity</b> Value of biodiversity -Consumptive use value - Productive use value - Social value -Ethical and moral values -Aesthatic value -Option value India as a mega diversity nation Threats to biodiversity	12	25

**Reference Book:** Paryavaran Adhyayan – University Grants Commission Oriental longman private limited.



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

B.C.A. Course: **Introduction to English Language and Literature - I**  
Course No: **BCA-FC-102**  
Semester: **01**  
Type of Course: **Foundation Course**  
Marking Scheme: **External Examination: 70 + Internal Examination: 30 = 100 Marks**  
Credits: **02**  
Theory Sessions per Week: **02**  
Teaching Hours: **36 Hours**

Unit No	Name of Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
01	Study of Short Stories	The Cherry Tree - Ruskin Bond Of Studies- Francis Bacon Five Kinds of Workers- Row and Wren. (Short notes 2/3 each in 500 words approximately)	09	18
02	Study of Poetry	Beauty – John Masefield Old Familiar Faces – Charles Lamb To the Cuckoo – William Wordsworth. (Short notes 2/3 each in 500 words approximately)	09	18
03	Parts of Speech	Jupp and Milne Grammar Book Chapter 1 only	09	17
04	Tenses & Vocabulary.	Introduction of Tenses Giving Personal Information. antonyms, synonyms, prefix, suffix, one word substitute		

**Reference Books**

1. Bond Ruskin, 'Treasury of Stories for Children', Puffin Books, New Delhi, 2001
2. Bacon, Francis, 'English Essayists', (Ed)Sinha, Susanta, OUP, 1987
3. Language Through Literature, OUP, 1969
4. Palgrave, F. T., 'The Golden Treasury', Rupa & Co, 2001
5. 'Prism', Ed: Board of Editors, Orient Blackswan, 2011
6. Green, David, 'Contemporary English Grammar Structures and Composition', Mac Millan, 1971
7. Issac, Anish, 'Amazing English', Anish Issac's Publishing House, Kerala, 2006
8. Jupp, and Milne, 'English Sentence Structure', ELBS, 1984.



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

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
	<ul style="list-style-type: none"><li>- Flowchart and Algorithm</li><li>- Introduction to programming language and types of programming language</li><li>- Concept of Editor, Compiler, Interpreter, Translator, Assembler</li><li>- Getting started with C: History, Structure of C program, Compilations &amp; linking C program</li><li>- Character Set, Keywords, Identifier, Data Type, Variable and Constant</li></ul>		
Unit-2	Programming Constructs	11	18
	<ul style="list-style-type: none"><li>- Formatted Input and output statements</li><li>- Operators</li><li>- Decision making and Branching (If, if-else, switch etc)</li><li>- Looping construct (While loop, Do..While loop, For loop etc)</li><li>- Break, Continue, go to and exit</li></ul>		
Unit-3	Array, sorting searching technique, character and string handling	11	17
	<ul style="list-style-type: none"><li>- Introduction of array</li><li>- Declaration and initialization of 1-D and 2-D arrays</li><li>- Programming using 1-D and 2-D Array</li><li>- Sorting method(selection, bubble),</li><li>- Searching method (linear, Binary)</li><li>- Declaration and initialization of string and character data</li><li>- Character and string operation</li><li>- Character and String handling Function</li></ul>		
Unit-4	Functions	11	17
	<ul style="list-style-type: none"><li>- Concept of modular programming</li><li>- Elements of function, Type of Function</li><li>- Declaration, Calling, and Defining a function.</li><li>- Passing Array and string as function argument</li><li>- Built-in Function: math's, input output function etc</li></ul>		
Reference Books			
<ol style="list-style-type: none"><li>1. Programming in ANSI 'C' – Balaguruswamy: TMH.</li><li>2. Let Us C By Yasvant Kanitkar</li><li>3. Mulish Cooper : The Spirit of C, Jaico Pub. House, 19th Edition-1999</li></ol>			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**(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
	<ul style="list-style-type: none"><li>- Basic concepts – Data, Information, Database, DBMS</li><li>- Overview of RDBMS – Tables, records (rows) &amp; fields (columns)</li><li>- Applications of RDBMS.</li><li>- Theoretical concepts – Entity, attribute, Tuple, Domain Set, Relationship between entities, E-R Diagrams, Normalization</li><li>- Dr. Codd's 12 rules</li></ul>		
Unit 2	Basic elements of database and Detailed look on Queries in open office.	11	18
	<ul style="list-style-type: none"><li>- Creating a table, various data types, other properties of field</li><li>- Creating form and report using single table</li><li>- Modifying form and report layout</li><li>- Select queries – By Design and SQL statement – on single table</li><li>- Select queries based on multiple tables (rigorous practical exercises to be covered)</li><li>- Insert, Update &amp; Delete queries – Design, SQL statements, execution, How they differ from select query</li><li>- Advanced query building</li><li>- Automating Tasks using Macro</li></ul>		
Unit 3	Electronics Spreadsheet as database in open office	11	17
	<ul style="list-style-type: none"><li>- Introduction to spreadsheet : Opening Spreadsheet, Menus - main menu, Toolbars, Spread sheet addressing - Rows, Columns &amp; Cells, Referring Cells &amp; Selecting Cells</li><li>- Entering the data in tabular form, inserting / deleting of rows and columns</li><li>- Using formula in columns</li><li>- Database operations: Sorting, Filtering, Consolidation, and Subtotal.</li></ul>		
Unit 4	Importing & Exporting Data in open office	11	17
	<ul style="list-style-type: none"><li>- Importing Data from text file, XML file, Spreadsheet file</li><li>- Exporting Data to text file, XML file, Spreadsheet file</li><li>- Managing Database – Taking Backups &amp; Repair Database</li></ul>		
Reference / Text-Books / Additional Reading :			
<ol style="list-style-type: none"><li>1. Desai Bipin C: Introduction to database Systems, West Publishing Co.</li><li>2. A conceptual guide to open office.org3 R. Gabriel Gurely</li></ol>			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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B.C.A.		Course: Mathematics	Course No: BCA-CC-106
Semester: 01		Type of Course: Core Course	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100 Marks			
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Sets and Functions	11	18
	Sets Introduction to set theory, Methods of representation of a set, Operations on Set, Algebra of Sets, DE ‘Morgan’s Law and examples. Functions Function Definition, Domain, Range, One-to-One function, onto function. Composite function and Inverse of a function.		
Unit-2	Vectors	12	18
	Definition of Vector, Addition and Subtraction of Vectors, Magnitude of a Vector, Unit Vectors, Dot Product and Cross Product.		
	Matrices		
	Definition of a Matrix, Equal matrices, Diagonal element of a matrix, Row matrix, Column Matrix, Symmetric Matrix, Skew-Symmetric Matrix, Orthogonal Matrix, Diagonal Matrix, Identity Matrix. Operation on a Matrix (Addition, Subtraction and Multiplication), Inverse of a Matrix.		
Unit-3	Permutation & Combination	11	17
	Permutation Meaning of permutation, Formula of permutation, Permutation of n-different things, Permutation of similar things, Permutation of repeated things, Circular Permutation Combination Combination: Meaning of Combination, Formula of Combination.		
Unit-4	Graph Theory	11	17
	Introduction to Graph, Graph Definition, Vertices, Edges, Loops, Parallel Edges, Simple Graph, Finite Graph, Adjacent vertices, Incidence between vertex and edge, Degree of a vertex, Isolated Vertex, Pendent Vertex, Null Graph. Isomorphism, Labeled Graph, Unlabeled Graph. Walk, Closed Walk, Open Walk, Simple Path, Circuit, Connected Graph. Tree Definition, Rooted Tree, Binary tree and its properties, Uses of Binary Tree. Level of a tree. Note: Only Concepts and Simple Examples are included. Theorems are not included.		

Break up of Continuous Internal Evaluation:

1. TEST	15 Marks
2. ASSIGNMENT/PRESENTATION	10 Marks
3. SEMINAR/ ATTENDANCE	05 Marks
Total	30 Marks

**Reference Books**

1. D. C. Sancheti, V. K. Kapoor: Business Mathematics, Sultan Chand & sons.
2. Lipschutz & Marc Lipson: DISCRETE MATHEMATICS, Tata Mcgraw Hill
3. Narsingh Deo: Graph Theory with application to engineering and computer science, Prentice Hall of India Pvt. Ltd



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

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





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

Structure for B.C.A. – CBCS Programme

**Semester-II (FY)**

<b>COURSE NO.</b>	<b>COURSE TYPE</b>	<b>SUBJECT</b>	<b>CREDIT</b>
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



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**B.C.A.**  
**SEMESTER-II**

**Paper EC: 201**

Title of the Paper: **Environmental Science – II**

Credits: **02**

Marks: Semester End Internal Examination: **100 Marks**

Examination: **Internal evaluation**

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
1	<b>Climate change</b> -Global warming -Case study of globalwarming -Acid rain -Case study of Acid rain -Ozon layer depletion -Case study of Ozon layer depletion	12	25
2	<b>Pollution</b> -Air pollution -Water pollution -Noise pollution -Pollution case study -Minamata disease -Ground water pollution in India -Pesticides pollution in India -River pollution in India.	12	25
3	<b>- Disaster management</b> Floods                  Earthquake Cyclones                Landslide <b>Social issues and the environment :</b> -Unsustainable to sustainable development -Water conservation : -Rain water harvesting -Water shed management -The air (prevention and control of pollution) Act -The water (prevention and control of pollution) Act -The wildlife (protection ) Act -Using an environmental calender of activities	12	25
4	<b>Population Growth and the Environment :</b> -Population growth variation among nation -Population explosion : family welfare programme -Methods of sterilisation -Urbanization -Urban poverty and environment -Environment and human health -Bhopal gas incident -Climate and health -Infectious disease -Globalization and Infectious disease -Water born disease -Water scarecity diseases -Diarrhea -Cancer and the environment	12	25

**Reference book:** Paryavaran Adhyayan – University Grants Commission Oriental longman private limited.



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**B.C.A.**

**SEMESTER-II**

B.C.A. Course: **Introduction to English Language and Literature - II**  
Course No: **BCA-FC-202**  
Semester: **02**  
Type of Course: **Foundation Course**  
Marking Scheme: **External Examination: 70 + Internal Examination: 30 = 100 Marks**  
Credits: **02**  
Theory Sessions per Week: **02**  
Teaching Hours: **36 Hours**

Unit No	Name of Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
01	Study Poems and Prose.	Daybreak – Henry Longfellow Beautiful Things – Ellen P. Allerton The Sun and the Planets – C. Jones (Short notes 2/3 each in 500 words approximately)	09	18
02	Study Poems and Prose.	Climbing Everest – B. Mathur Gold Frame – R. K. Narayan The Tiger Smiled – Jim Corbet (Short notes 2/3 each in 500 words approximately)	09	18
03	Improve Business English & Grammar.	Use of Internet Chapter 1 only from 50 Ways to Improve Business English Using the Internet Introduction of email. Introduction of Verb Forms Introduction of Modal Auxiliary Verbs.	09	17
04	Professionalism.	personal and Food Etiquette Professions and occupations.	09	17

**Reference Books**

1. Bond Ruskin, 'Treasury of Stories for Children', Puffin Books, New Delhi, 2001
2. Bacon, Francis, 'English Essayists', (Ed)Sinha, Susanta, OUP, 1987
3. Language Through Literature, OUP, 1969
4. Palgrave, F. T., 'The Golden Treasury', Rupa & Co, 2001
5. 'Prism', Ed: Board of Editors, Orient Blackswan, 2011
6. Green, David, 'Contemporary English Grammar Structures and Composition', Mac Millan, 1971
7. Issac, Anish, 'Amazing English', Anish Issac's Publishing House, Kerala, 2006
8. Jupp, and Milne, 'English Sentence Structure', ELBS, 1984.



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**(With effect from Academic Year: 2019-20)**

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
	<ul style="list-style-type: none"><li>- Information Systems and Technologies</li><li>- Importance of Information Systems in Businesses</li><li>- Components of an Information System</li><li>- Information System Resources – people, hardware, software, data, network</li><li>- Gaining strategic advantage through IT</li><li>- Managerial Challenges of IT</li><li>- Introduction to Information Systems: - Manufacturing, Marketing, Accounting, Human Resources Management, Financial Management, Inventory Management.</li><li>- Introduction to Enterprise Resource Planning.</li><li>- Enterprise Applications:-Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management</li></ul>		
Unit-2	Introduction to E-Commerce	11	18
	<ul style="list-style-type: none"><li>- Definition, communication perspective, Business Process Perspective, Service Perspective</li><li>- Classification by nature of transaction : B2B, B2C, C2C, C2B, Non Business EC, Intra-Business EC</li><li>- Classification of EC Applications: Electronic Market, Inter Organizational System, Customer Services</li><li>- Benefits to Organizations, Consumers and Society</li><li>- Limitations of EC, Framework of EC, Future of EC</li></ul>		
Unit-3	E-Commerce Business and Electronic Market Places	11	17
	<ul style="list-style-type: none"><li>- Introduction, Eight Key Ingredients of a Business Model, Major B2C and B2B Business Models, Introduction to M-Commerce.</li><li>- Market space Components, Types of Electronic Markets (Electronic Storefronts, Electronic Malls, Types of Stores and Malls)</li><li>- 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)</li></ul>		
Unit-4	Customer Relationship Management (CRM)	11	17
	<ul style="list-style-type: none"><li>- 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)</li></ul>		



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)



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

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 <span> and <div> 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



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**(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.			



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

B.C.A.	Course: Statistics	Course No: BCA-CC-206
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	Measure of Central Tendency	12	18
	Definition, Ungrouped Data, Grouped Data (Discrete and Continuous Grouped data). Mean: Arithmetic Mean, Geometric Mean and Harmonic Mean for ungrouped data, Combined Mean and Weighted Mean. Median, Quartiles, Deciles, Percentiles and Mode.		
	Measure of Dispersion		
	Definition, Different measure of dispersion. Quartile Deviation, Mean Deviation, Standard Deviation, Combined Standard Deviation, Coefficient of Variation.		
Unit-2	Correlation and Regression	11	18
	Correlation:-Definition, Types of Correlation (positive and negative correlation), Correlation Coefficient. Karl Pearson's Method and Spearman Rank correlation coefficient method. Regression Regression: Linear regression, regression line of y on x and regression line of x on y. Difference between Correlation and Regression.		
Unit-3	Probability	11	17
	Probability:-Random Experiment, Sample Space, Event, Mutually exclusive event, Exhaustive event, Equally likely event and probability Classical definition. (Simple examples of Probability).		
Unit-4	Probability Distribution	11	17
	Binomial distribution Poisson Distribution Normal Distribution		

Break up of Continuous Internal Evaluation:

1. TEST	15 Marks
2. ASSIGNMENT/PRESENTATION	10 Marks
3. SEMINAR/ ATTENDANCE	05 Marks
Total	30 Marks

Reference Books
1. Gupta and Gupta: Business Statistics, Sultan Chand and Sons.





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

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 <b>BCA-CC-204</b>	50
Unit-2	Practical Problem from <b>BCA-CC-205</b>	50



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

Structure for B.C.A. – CBCS Programme

**Semester-III (SY)**

<b>COURSE</b>	<b>COURSE</b>	<b>SUBJECT</b>	<b>CREDIT</b>
BCA-EC-301	ELECTIVE	Disaster Management	02
BCA-FC-302	FOUNDATION	Business Communication – III	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
<b>TOTAL</b>			<b>28</b>



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

**B.C.A.**  
**SEMESTER –III**

EC: 301- Disaster Management

Credit: 02

Total Marks: 100 Marks.

Semester End Examination: 70 Marks

Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Marks/ Weight
1	<b>Introduction to Natural Disaster</b> <b>Introduction to Disaster Management.</b> Types, Trends, Causes, Consequences and Control of Disasters <b>Geological Disasters:</b> earthquakes, landslides, tsunami, mining <b>Hydro-Meteorological Disasters:</b> Floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves. <b>Biological Disasters:</b> Epidemics, pest attacks, forest fire. <b>Technological Disasters:</b> Chemical, industrial, radiological, nuclear. <b>Man-made Disasters:</b> Building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters. <b>Global Disaster Trends</b> – Emerging Risks of Disasters – Climate Change and Urban Disasters. <b>Earthquake</b> Introduction, Examples of Earthquake from the record, Precautions taken during Earthquake, Richter scale. Destruction caused by earthquake, Earthquake prone zone of India.	14
2	<b><u>Land slide</u></b> Causes of landslide, Types of landslide Sliding forces, Clues to land slides Prevention of landslides, Damage caused by land slide. <b><u>Tsunami</u></b> Introduction Tsunami in India, Precautions taken during Earthquake Destruction caused by tsunami	14
3A	<b><u>Flood</u></b> Types of flood Causes of flood, Damage caused by flood Protective steps against flood, What to do after flood Organization involved in flood relief Major flood records in India <b><u>Rain Water Harvesting</u></b> Introduction Need for rain water harvesting, Method for rain water harvesting	14
3B	<b><u>Cyclone</u></b> Introduction Cyclones of India, Cyclones prone areas of India Destruction caused by cyclones	14



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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	<b>Fire and Fire Prevention</b> Precaution for fire, What to do and not to do during fire. Fire safety Management.	
4	<b><u>Drought</u></b> Introduction Types of drought, Causes of drought Impact of drought, Drought management <b>Disaster Management in India</b> Disaster Management Act 2005 – Institutional and Financial Mechanism National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national), Non-Government and Inter-Governmental Agencies	14

**:: REFERENCE BOOK ::**

1. **Paryavaran Adhyayan**–University Grants Commission Oriental longman private limited.
2. **Paryavaran and Aapatti Vyavasthapan [Gujarati]**, Modi C D & others (2006). Swami prakashan, Patan-384265
3. **Paryavaran and disaster management [Gujarati]**, Patel J C (2006), Parshwa publication, Ahmedabad-380001
4. **Disaster Management**, K Ramana Murthi, 2004, Dominant Publishers and Distributors, New Delhi.
5. **Concept of Ecology**: N. Arumugam Saras publication.



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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**B.C.A.**

**SEMESTER –III**

FOUNDATION COURSE-FC: 302- Business Communication – III

Credit: 02

Total Marks: 100 Marks.

Semester End Examination: 70 Marks

Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
01	<i>Barriers to Communication.</i> 1 Physical Barriers. 2 Language Or Semantic Barriers. 3 Socio –Psychological Barriers. 4 How to Overcome Barriers.	09	14+06
02	<i>Listening : A COMMUNICATION TOOL</i> 1 Introduction. 2 What is Listening? 3 Common Faults of Listening. 4 How to Improve Listening Skills? 5 Approaches to Listening.	09	14+06
03	<i>Group Communication.</i> 1 Introduction. 2 What is Group? Group Personality. 3 Types of Groups. & Formal and Informal. 4 Why Groups? 5 The Role of Communication in the Small Group. 6 Look at the features that a Group Discussion possesses. 7 How to make Group Discussion effective? Advantages and Disadvantages of Group Discussion.	09	14+06
04	<i>Interview</i> 1 Meaning and Definition of Interview. 2 Purpose of Interview. 3 Essential Features of Interview. 4 Methods of Interview. 5 Styles of Interview. 6 Types of Interview. 7 Preparation of the Candidate for the Interview. 8 Success Tips for the Candidate. 9 Guidelines for the Candidate.	09	14+06
05	<i>Orders and their Execution</i> 1 Chief Characteristics of Order Letter. 2 Placing an Order Letter. 3 Acknowledging Orders. 4 Reply to Orders. 5 Cancelling the Order.	09	14+06



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

<b>B.C.A.</b>		<b>Course:</b> Operating System	<b>Course No:</b> BCA-CC-303	
<b>Semester:</b> 03		<b>Type of Course :</b> Core Course		
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100		<b>Credits:</b> 03		
<b>Theory Sessions per Week:</b> 03		<b>Teaching Hours:</b> 45 Hours		
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
<b>Unit-1</b>	<b>Basic concept of an operating system</b>	<b>12</b>	<b>18</b>	
	<ul style="list-style-type: none"><li>- Definition and Function of operating systems.</li><li>- Evolution of operating system: Batch system, Multi programmed system, time sharing and PCs.</li><li>- Introduction to basic terms &amp; batch processing system: Jobs, Processes files, command interpreter.</li><li>- Different types of operating system-real time systems, parallel, distributed system.</li><li>- Operating system structure-monolithic layered, virtual machine &amp; Client server.</li></ul>			
<b>Unit-2</b>	<b>Process Management</b>	<b>11</b>	<b>18</b>	
	<ul style="list-style-type: none"><li>- Processes: Definition, Process States , Process Control Block ,Context switching.</li><li>- Process Scheduling: Definition, Scheduling objectives.</li><li>- Types of Schedulers ,Scheduling criteria : CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition only) ,</li><li>- Scheduling algorithms : Pre emptive and Non , pre emptive , FCFS – SJF – RR</li></ul>			
<b>Unit-3</b>	<b>Deadlocks and Threads</b>	<b>11</b>	<b>17</b>	
	<ul style="list-style-type: none"><li>- Definition, Deadlock characteristics, Deadlock Prevention.</li><li>- Introduction of Deadlock Avoidance: banker's algorithm and problem solving,</li><li>- Deadlock detection and Recovery.</li><li>- Threads - Concept of multithreads, Benefits of threads – Types of threads.</li></ul>			
<b>Unit-4</b>	<b>Memory Management – Basic Memory Management and Virtual Memory</b>	<b>11</b>	<b>17</b>	
	<ul style="list-style-type: none"><li>- Definition, Logical and Physical address Map.</li><li>- Memory allocation: Contiguous Memory allocation – Internal and External fragmentation.</li><li>- Paging: Principle of operation – Page allocation – Hardware support for paging – Protection and sharing – Disadvantages of paging.</li><li>- Segmentation.</li><li>- Introduction to Virtual Memory.</li><li>- Page Replacement policies, Optimal (OPT) , First in First Out (FIFO), Least Recently used (LRU)</li></ul>			
<b>Reference Books</b>				
<ol style="list-style-type: none"><li>1. Silberschatz, Galvin and Gange: Operating System Concepts, Wesley.</li><li>2. Tanenbaum A.S., “Modern Operating Systems”, 4th Edition, PHI, 2001</li><li>3. Stalling W, “Operating Systems”, 6th edition, Prentice Hall India.</li></ol>				



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

<b>B.C.A.</b>		<b>Course:</b> Data and File Structure	<b>Course No:</b> BCA-CC-304
<b>Semester:</b> 03		<b>Type of Course :</b> Core Course	
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100		<b>Credits:</b> 03	
<b>Theory Sessions per Week:</b> 03		<b>Teaching Hours:</b> 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction to Data Structure and Sorting Techniques</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Definition of Data Structure, Classification of Data Structure (Linear, Non Linear)</li><li>- Applications, Aims and Goals of Data Structure, Sparse Matrix.</li><li>- Representation of Array in Memory: Row-Major and Column-Major order.</li><li>- Address calculation of elements of one and two-dimensional arrays.</li><li>- Sorting and Merging Methods: Insertion Sort, Shell Sort, Quick Sort, Merge Sort.</li></ul>		
<b>Unit-2</b>	<b>Linear Data Structure : Doubly Linklist</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Introduction to Linked list and its types.</li><li>- Introduction of Doubly Linked list.</li><li>- Advantages and Disadvantages of Doubly linked list.</li><li>- Application of Doubly linked list.</li><li>- Different between single and double link list.</li><li>- Operation on Doubly Linked list.(insert, update, delete, display Algorithm and program)</li></ul>		
<b>Unit-3</b>	<b>Linear Data Structure: Stack and Queue</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Definition of Stack, Applications of Stack.</li><li>- Stack Operations using Array (Push, Pop, Peep, Display)</li><li>- Stack Operations using Linked List (Push, Pop, Peep, Display) (Algorithm and Program of All Stack Operations using Array and Linked List)</li><li>- Polish Notation: Conversion of Expression (Prefix, Infix, Postfix) (using hand or stack method)</li><li>- Definition of Queue, Applications of Queue.</li><li>- Queue Operations using Array (Insert, Update, Delete, Display)</li><li>- Queue Operations using Linked List (Insert, Update, Delete, Display) (Algorithm and Program of All Queue Operations using Array and Linked List)</li><li>- Circular Queue using Array.</li><li>- Concept of Priority Queue and Double Ended Queue.</li></ul>		



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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Unit-4	Non Linear Data Structure: Tree and Graph	11	17
	<ul style="list-style-type: none"><li>- Concept of Binary Tree, Representation of Binary Tree: Sequential and Linked List.</li><li>- Types of Binary Tree : Strictly, Full, Complete, in complete,</li><li>- Creation of Binary Tree - Binary Tree Traversal : Pre order, In order, Post order (using recursion)</li></ul> Definition of Graph and its terminologies <ul style="list-style-type: none"><li>- Representation of Graph : Adjacency Matrix, Adjacency List</li></ul> 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)		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. Data and File Structure: Trembly &amp; Sorenson.</li><li>2. Expert in Data Structure With C: R.B.Patel.</li><li>3. Data Structure using C: Aaron M. Tenenbaum.</li><li>4. Data Structure through C: G.S.Baluja</li></ol>			





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

<b>B.C.A. Course:</b> Object Oriented Programming with C++ <b>Course No:</b> BCA-CC-305			
<b>Semester:</b> 03 <b>Type of Course :</b> Core Course			
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100 <b>Credits:</b> 03			
<b>Theory Sessions per Week:</b> 03 <b>Teaching Hours:</b> 45 Hours			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Principal Of Object Oriented Programming</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Introduction of OOP, OOP V/s POP</li><li>- Concept of OOP – Object, Class, Inheritance, Encapsulation, Polymorphism, Abstraction, Message Passing</li><li>- Structure Of C++ Program</li><li>- Tokens in C++</li><li>- Data type, Constant, Variable, Statement &amp; Operators</li><li>- Function – Member function, Inline function, Friend function</li><li>- Input/output statements</li><li>- Declaration &amp; Creation of Class and Object</li></ul>		
<b>Unit-2</b>	<b>Constructor, Operator overloading and Type conversion</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Constructor – Types of constructor, characteristics of constructor, constructor overloading.</li><li>- Destructor</li><li>- Basic of operator overloading</li><li>- Types of operator overloading-Unary, Binary</li><li>- Operator overloading using member function &amp; friend function</li></ul>		
<b>Unit-3</b>	<b>Type Conversion and Inheritance</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Type conversion</li><li>- Categories of type conversion</li><li>- Basic of inheritance-</li><li>- Types of inheritance- Single level, multiple, multilevel, hierarchical and hybrid</li><li>- Constructor in derived class</li><li>- Concept of Abstract class</li><li>- Nesting of classes</li></ul>		
<b>Unit-4</b>	<b>Polymorphism</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Basic of Polymorphism-Compile time &amp; Runtime polymorphism</li><li>- This pointer</li><li>- Pointers to derived classes</li><li>- Virtual and Pure virtual function</li><li>- Virtual constructor and destructor</li></ul>		

**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



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

<b>B.C.A.</b> <b>Course:</b> System Analysis And Design <b>Course No:</b> BCA-CC-306			
<b>Semester:</b> 03 <b>Type of Course :</b> Core Course			
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100			
<b>Credits:</b> 03 <b>Theory Sessions per Week:</b> 03 <b>Teaching Hours:</b> 45 Hours			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit 1</b>	<b>System Concept</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Introduction to system</li><li>– Characteristics and elements of system</li><li>– Types of system</li><li>– System analysis</li><li>– System analyst &amp; its role.</li><li>– CBIS, Information system and categories of information system.</li><li>– System users.</li></ul>		
<b>Unit 2</b>	<b>System Development Strategies</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Introduction to SDLC</li><li>– Phases of SDLC</li><li>– Application of SDLC Method</li><li>– Limitation of SDLC Method</li><li>– Introduction to SSADM, Need of SSADM</li><li>– System survey</li><li>– Structured analysis</li><li>– Structured design</li><li>– Advantages of SSADM</li><li>– System Prototype Method (SPM)</li></ul>		
<b>Unit 3</b>	<b>Input/ Output Design &amp; Fact Finding Techniques</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Input – data capture objectives.</li><li>– Data verification &amp; Validation</li><li>– Interactive screen</li><li>– Output - Design of Output &amp; its Objectives</li><li>– FFT – Interview, Questionnaire, Record Inspection, Observations.</li></ul>		
<b>Unit 4</b>	<b>Analysis &amp; Design Tools</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– DFD, Symbols uses in DFD, Physical &amp; Logical Design</li><li>– Decision table &amp; tree</li><li>– Data Dictionary</li><li>– HIPO chart, Warnier/Orr diagrams</li><li>– Structured English</li></ul>		
<b>Reference Book:</b>			
<ol style="list-style-type: none"><li>1. James A Senn: Analysis and Design of Information Systems, McGraw Hill Intl. Std. Edn</li><li>2. S. Parthasarthy &amp; B. W. Khalkar : System Analysis &amp; Design 1st Edition, Master Ed.Cons.</li><li>3. Yourdon E. and Constantine L. L : Structured Analysis &amp; Design Yourdon press NY</li></ol>			



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

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

<b>COURSE</b>	<b>COURSE</b>	<b>SUBJECT</b>	<b>CREDIT</b>
BCA-EC-401	ELECTIVE	Nano-Materials & Nano-Technology	02
BCA-FC-402	FOUNDATION	Business communication – IV	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
<b>TOTAL</b>			<b>28</b>



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

**B.C.A. Semester: IV**  
**Paper EC: 401**

Title of the Paper: **Nanomaterials and Nanotechnology**

Credits: **02**

Semester End Examination of : **70Marks**

Continous Internal Evaluation: **30 Marks**

Total Marks : 100 Marks

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
1	<b>Introduction and preparation:</b> Introduction to Nanomaterials, Optical, magnetic and chemical properties of Nanomaterials, Preparation of Nanoparticles: Chemical Approaches: Chemical reduction: sonochemical synthesis, Sol-Gel Synthesis, Self assembly. Physical Approaches, Aerosol, Laser vaporization and vapour deposition, sputtering.	11	17
2	Nanostructured materials: Quantum dots, wells & wires, Carbon Nanotubes (CNTs), Singal walled carbon nanotubes (SENTs), Multiwalled carbon nanotubes (MWNTs), Graphencs. Fullerenes. Metal Oxid nanoparticles (NPs), Nanorods, Nanotubes and Nanofibers, Semiconductor quantum dots Polymer NPs.	11	17
3	<b>Characterization Techniques for Nanomaterials:</b> Paricle size Analyser (Laser scattering), Optical Microscopy, Seanning Electron Mieroscopy (SEM), Transmission Electron Microscopy (TEM), Scanning Tunnel Microscopy (STM).X-ray Diffraction (XRD), Auger Emiission Spectroscopy, Electron Spectroscopy for Chemical analysis (ESCA)	12	18
4	<b>Application of Nanomaterials:</b> Application Solar energy conversion and catalysis, Polymer with a special architecture: Liquid crystalline systems, Application in displays and other devices, Advanced organic materials, data storage, Photonics, Chemical and biosensors, Nanomedicine and Nanobiotechnology.	11	18

**:: REFERENCE BOOK ::**

1. Introduction To Nanotechnology: Understanding The Essentials, By Risal Singh And Shipra Mital Gupta
2. Textbook Of Nanoscience And Nanotechnology, Textbook By B.S. Murty, Baldev Raj, James Murday, And P. Shankar



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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**B.C.A.**

**SEMESTER – IV**

BCA-FC-402: Business Communication – IV

Credit: 02

Total Marks: 100 Marks.

Semester End Examination: 70 Marks

Internal Evaluation: 30 Marks

Foundation Course.

Unit	Detailed Syllabus	Teaching Hours	Marks/ Weightage
01	<i>Management Communication</i> 1 Introduction. 2 Need For Organizational Communication. 3 Importance of Organizational Communication. 4 Principles of Effective Organizational Communication. 5 Causes for Poor Organizational Communication.	09	14+06
02	<i>Written Communication.</i> 1 Introduction. 2 Essentials of a Good Business Letter. 3 Basic Considerations while Writing Business Letters. 4 Parts of Business Letter. 5 Styles & Layout of Business Letter.	09	14+06
03	<i>Corporate Communication.</i> 1 Corporate & Communication. 2 Defining Corporate Communication. 3 Employee Relations & Communication. 4 Crisis & Disaster: 5 Managing & Communicating.	09	14+06
04	<i>Conflict and Negotiation in Organizations.</i> 1 What is Conflict? Defining Conflict. 2 Origins of Conflict. 3 Guidelines for Effective Conflict Management. 4 Conflict and Negotiations in Industrial Relations. 5 Guidelines for successful Negotiations Rights & Wrong.	09	14+06
05	<i>Tenses</i> 1 Introduction of Tenses. 2 Verb Forms. 3 Active & Passive Voice.	09	14+06

For Unit – 01

“Communication: By C.S. Rayudu. Himaliya Publishing House. New Delhi.

Chapter No: 08 ‘Management Communication’. Page No: 216 to 250.

For Unit – 02

“Communication: By C.S. Rayudu. Himaliya Publishing House. New Delhi.

Chapter No: 04 ‘Written Communication’. Page No: 146 – 181



For Unit – 03

“Business And Managerial Communication” By Sailesh Sengupta. PHI Learning Private LTD. New Delhi. 110001. Chapter No: 19 ‘Corporate Communication’.

Page No: 529 to 559.

For Unit – 04

“Business And Managerial Communication” By Sailesh Sengupta. PHI Learning Private LTD. New Delhi. 110001. Chapter No: 18 ‘Conflict & Negotiation In Organization’. Page No: 492 to 528

For Unit – 05

A Practical English Grammar. A.J. Thomson & A.V. Martinet. Oxford University Press. New Delhi.

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Reference Books

- 1 Business Communication. Sathya Swaroop Debasish & Bhagaban Das. PHI Learning Private Limited. New Delhi.
  - 2 Business Communication and Organization & Management. Rohini Aggarawal Taxman Publisher. New Delhi.
  - 3 Business and Managerial Communication. Sailesh Sengupta. PHI Learning Private Limited. New Delhi.
  - 4 A Practical English Grammar. A.J. Thomson & A.V. Martinet. Oxford University Press. New Delhi.
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**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
(With effect from Academic Year: 2019-20)

<b>B.C.A. Course:</b> Advance Operating System and Intro. to Linux <b>Course No:</b> BCA-CC-403			
<b>Semester:</b> 04 <b>Type of Course :</b> Core Course			
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100			
<b>Credits:</b> 03 <b>Theory Sessions per Week:</b> 03 <b>Teaching Hours:</b> 45 Hours			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>File Management and Directory Managment</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– File format, Characteristics of file, File operations, File system structure,</li><li>– File access methods: Sequential , direct and Index sequential.</li><li>– Directory structure: single level, two level, tree level ,</li><li>– Directory operations, directory implementation: Linear list, Hash table</li><li>– Disk Space Allocation Method : Continuous, Linked, Index, Free Space Management.</li></ul>		
<b>Unit-2</b>	<b>I/O Management</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Typical PC Bus structure, Pooling and Interrupts, DMA Controller , Kernel I/O Subsystem: I/O Scheduling, Buffering, Caching, Spooling, Error Handling.</li><li>– Mass Storage Structure and Disk scheduling algorithm (FIFO, SSTF, SCAN, C- SCAN.)</li></ul>		
<b>Unit-3</b>	<b>Introduction to Unix and Linux Operating System (Open Source)</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– History of Unix Operating System Definition of Kernel, Shell, File, Process,</li><li>– 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</li></ul>		
<b>Unit-4</b>	<b>File Structure and Linux Shells.</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Understanding File system hierarchy standard, Directory Commands, File and Directory commands, Understanding Job (process).</li><li>– Process Commands, User commands: Misc Commands, Keyboard commands using ctrl key.</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. Silberschatz, Galvin and Gange: Operating System Concepts, Wesley.</li><li>2. Tanenbaum A.S., “Modern Operating Systems”, 4th Edition, PHI, 2001</li><li>3. Stallings W, “Operating Systems”, 6th edition, Prentice Hall India.</li><li>4. Sumitabha Das: Concepts and Application of UNIX 4th edition Tata McGraw Hill</li><li>5. Yashwant Kanitkar: Unix Shell Programing, BPB Publication</li></ol>			





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

<b>B.C.A. Course:</b> Application Development Using VB.NET <b>Course No:</b> BCA-CC-404			
<b>Semester:</b> 04 <b>Type of Course :</b> Core Course			
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100			
<b>Credits:</b> 03 <b>Theory Sessions per Week:</b> 03 <b>Teaching Hours:</b> 45 Hours			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– .Net Framework, Common Language Runtime</li><li>– Feature &amp; Advantages of CLR.</li><li>– JIT &amp; It's Types : Pre-JIT, Econo-JIT, Normal-JIT</li><li>– Introduction to Integrated Development Environment (IDE)</li><li>– Programming Construct – Variable, Datatype, Type Casting, control structure, looping statement, array, function &amp; procedure, Exception Handling.</li></ul>		
<b>Unit-2</b>	<b>Basic Controls and Advance Control</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Introduction of form.</li><li>– Label, Textbox, Button.</li><li>– Link Label, Combo box, List box, Checkbox, Radio button, Scrollbar.</li><li>– Timer Control, Group box, Panel</li><li>– Event Handling, Method &amp; Property of controls.</li><li>– MDI &amp; SDI form, Main Menu Strip &amp; Context Menu.</li><li>– Rich text box, Picture box, Date time Picker.</li><li>– Track bar, Notify Icon, Progress Bar, Tool tip</li></ul>		
<b>Unit-3</b>	<b>Dialog Box and Database Connectivity</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Built In Dialog box (Open File Dialog, Save File Dialog, Color Dialog, Font Dialog, Folder Browser Dialog)</li><li>– ADO.Net Architecture.</li><li>– Create database using MS Access and accessing database using server explorer.</li><li>– Database connectivity using programming code.</li><li>– Database binding with Data Grid View &amp; combo box.</li><li>– Crystal Report.</li></ul>		
<b>Unit-4</b>	<b>Object Oriented Programming</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Class, Object &amp; it's characteristics</li><li>– Inheritance, Polymorphism.</li><li>– Function Overloading</li><li>– Properties: Read Only Properties, Write Only Properties.</li><li>– Constructor &amp; Destructor.</li><li>– Small application development.</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. Steven Holzner: Visual Basic .NET Programming Black Book DeramTech Press.</li><li>2. Rod Stephens: Visual Basic 2005 Programmer's</li></ol>			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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<b>B.C.A. Course:</b> Web Application Development Using PHP <b>Course No:</b> BCA-CC-405			
<b>Semester:</b> 04 <b>Type of Course :</b> Core Course			
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100			
<b>Credits:</b> 03 <b>Theory Sessions per Week:</b> 03 <b>Teaching Hours:</b> 45 Hours			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Fundamental of webpage, website and apache server</li><li>– Static and Dynamic Website</li><li>– Introduction of PHP-Features, Advantages and Limitations</li><li>– Data Type, Variable, Constant</li><li>– Operator in PHP</li></ul>		
<b>Unit-2</b>	<b>Basic of PHP</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Conditional Statement</li><li>– Looping Statement</li><li>– Array- Types of Array(Numeric, Associative, Multi-dimensional)</li><li>– PHP Server variables</li><li>– Built-in-functions:<ul style="list-style-type: none"><li>○ <b>String</b>(print(),echo(),chr(),trim(),ltrim(),rtrim(),soundex(),str_word_count(),strcmp(),strcmpi(),strpos(),strlen(),strpos(),strrev(),substr(),strtoupper(),strtolower(),ucfirst(),ucword(),substr_replace())</li><li>○ <b>Mathematical</b>(abs(),sqrt(),log(),floor(),ceil(),pow(),max(),min())</li><li>○ <b>Date/Time</b>(Date(),time(),getdate(),gettimeofday(),localtime(),checkdate())</li></ul></li></ul>		
<b>Unit-3</b>	<b>Working with form , Cookie and Session</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Form elements- TextBox, TextArea, Password, RadioButton, Check Box, Combo Box, Image</li><li>– Buttons – Submit and Reset</li><li>– Uploading File to webserver</li><li>– POST &amp; GET method</li><li>– PHP include and require statement</li><li>– Basic of Cookie-Setting Cookies, Accessing Cookies, Deleting Cookies.</li><li>– Basic of Session- Starting a Session, Destroying a session.</li></ul>		
<b>Unit-4</b>	<b>Database Connectivity and Error Handling</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– PHP-MySQL architecture</li><li>– Database interaction –Creating and connecting database</li><li>– Executing commands- Selecting, Inserting, Updating, Deleting</li><li>– Small application development</li><li>– Error Handling- Try, Catch and Throw block, die() function</li><li>– Page redirection in PHP</li></ul>		



<b>Reference Books</b>
<ol style="list-style-type: none"><li>1. Ivan Bayross,Sharanam Shah:PHP 5.1 For Beginners,Sh off Publishers &amp; Distributors(SPD)</li><li>2. Janet Valade: PHP5 &amp; MYSQL Projects,Wiley Dreamtech</li><li>3. Dave W. Mercer: Beginning PHP5,Wiley India Edition</li><li>4. Steven Holzer:The Complete Reference PHP,Tata McGRAW-HiLL,New Delhi.</li></ol>



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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<b>B.C.A.</b>	<b>Course:</b> Object Oriented Analysis and Design	<b>Course No:</b> BCA-CC-406	
<b>Semester:</b> 04	<b>Type of Course :</b> Core Course		
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100			
<b>Credits:</b> 03	<b>Theory Sessions per Week:</b> 03	<b>Teaching Hours:</b> 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>SYSTEM DESIGN, SYSTEM TESTING &amp; IMPLEMENTATION</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Introduction to database?</li><li>- System development in database environment</li><li>- Design of database – Normalization</li><li>- Principles of Software Design</li><li>- System Testing</li><li>- Testing Strategies</li><li>- Types of system testing</li><li>- Level of Testing</li><li>- System conversion methods – parallel, direct cut over, pilot &amp; phase-in method.</li></ul>		
<b>Unit-2</b>	<b>OBJECT ORIENTED MODEL</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- What is object oriented model?</li><li>- Characteristics of OOM – class &amp; object, Link &amp; association, Generalization &amp; Inheritance.</li><li>- Benefits of OOM</li><li>- Introduction to OOA &amp; Advantages &amp; Disadvantages of OOA</li></ul>		
<b>Unit-3</b>	<b>OBJECT ORIENTED ANALYSIS &amp; DESIGN</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Analysis Techniques – Object Modeling, Dynamic Modeling &amp; Functional Modeling.</li><li>- Object design process, steps &amp; solution</li><li>- Defining classes &amp; its implementation, inheritance, association &amp; object representation.</li><li>- Breaking system into sub system &amp; managing data store.</li></ul>		
<b>Unit-4</b>	<b>MODELING &amp; IMPLEMENTATION STRATEGIES</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Object modeling – identifying object classes, user object model , object modeling notations.</li><li>- Dynamic modeling – state diagram</li><li>- Functional modeling – steps of constructing function model, DFD</li><li>- Structural Diagram – what is structural diagram &amp; class Diagram.</li><li>- Implementation strategies</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. James A Senn: Analysis and Design of Information Systems, McGraw Hill Intl. Std. Edn</li><li>2. Yourdon E. and Constantine L. L : Structured Analysis &amp; Design Yourdon press NY</li><li>3. Object Oriented Analysis and Design by James Rumbaugh, Michael Blaha, William Premerlain, Frederick Eddy, William Lorensen</li></ol>			



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

<b>Unit</b>	<b>Detailed Syllabus</b>	<b>Teaching Hours</b>	<b>Marks/Weight</b>
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)**

<b>COURSE</b>	<b>COURSE</b>	<b>SUBJECT</b>	<b>CREDIT</b>
BCA-EC-501	ELECTIVE	IT Project Management	02
BCA-FC-502	FOUNDATION	Business Communication –V	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
<b>TOTAL</b>			<b>28</b>



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<b>B.C.A. Course: IT PROJECT MANAGEMENT Course No: BCA-EC-501</b>			
<b>Semester: 05 Type of Course : Core Course</b>			
<b>Marking Scheme: External Examination: 70 + Internal Evaluation: 30 = 100</b>			
<b>Credits: 02 Theory Sessions per Week: 02 Teaching Hours: 30 Hours</b>			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction AND IT Project</b>	<b>8</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Definition of the project</li><li>- Project specification and parameters.</li><li>- Goals of IT Project Management.</li><li>- Project management life cycle</li><li>- Introduction to types of Project.</li><li>- Overview of Project Planning.</li><li>- Project Analysis.</li><li>- Software Estimation.</li></ul>		
<b>Unit-2</b>	<b>Activity Planning</b>	<b>8</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Project Management Activity.</li><li>- Project Coast Estimation.</li><li>- Project Planning.</li><li>- Project Scheduling.</li></ul>		
<b>Unit-3</b>	<b>Risk Management</b>	<b>7</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Risk Management: Resource Allocation –Monitoring and control.</li><li>- Team Management.</li><li>- Role and Responsibilities in Project Team</li><li>- Project Tracking.</li></ul>		
<b>Unit-4</b>	<b>Case Study</b>	<b>7</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Institute Management System, Inventory</li><li>- Management System, Hospital Management System,</li><li>- Hotel Management System, Etc.....</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. John J. Rakos, "Software Project Management", 1998, Prentice Hall</li><li>2. Walker Royce, "Software Project Management", 2001, Pearson Education.</li><li>3. Roger S. Pressman, "Software Engineering", 2001, McGraw Hill.</li><li>4. Jack T. Marchewka, Information Technology Project Management, 4th Edition.</li><li>5. Mike Cotterell, Bob Hughes- Software Project Management- McGraw Hill 5th Edition.</li></ol>			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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B.C.A.

Course No: FC-502

BUSINESS COMMUNICATION – V

Credits: 02

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
01	<p style="text-align: center;"><i>Banking Correspondence:</i></p> <ol style="list-style-type: none"><li>1 Bird's eye view of banking sector in India.</li><li>2 Types of banks and bank Accounts.</li><li>3 Functions of banks.</li><li>4 Elements of Good banking.</li><li>5 <i>Letters Between Banks and their Clients :</i></li><li>6 Customer asking for Stop payment of cheque/demand draft.</li><li>7 Bank manager's reply to the stop payment request.</li><li>8 Customer asking for loan.</li><li>9 Loan granted/not granted by the bank.</li><li>10 Customer's complaint of dishonourment of cheque in spite of sufficient balance in his account.</li><li>11 Banker's reply explaining the reason for dishonoring of the cheque.</li><li>12 Customer requesting the bank manager to issue a duplicate key of his safe deposit vault.</li><li>13 Banker's reply explaining him the relevant procedure for obtaining the duplicate key of safe deposit vault.</li></ol>	09	14
02	<p style="text-align: center;"><i>Insurance Correspondence: ( Life Insurance )</i></p> <ol style="list-style-type: none"><li>1 Basic Principles of Insurance.</li><li>2 Definition of Life Insurance.</li><li>3 Life Insurance terminology.</li><li>4 Various types of Life Insurance policies.</li><li>5 Letters between LIC and Policy Holders.</li><li>6 Policy holder intimating the insurance company regarding change of residential address.</li><li>7 Policy holder requesting for a duplicate copy of policy.</li><li>8 Policy holder asking for the surrender/paid up value of his policy.</li><li>9 LIC's reply to the policy holder regarding the surrender value.</li><li>10 paid-up values and advising him against surrendering his policy.</li><li>11 Nominee's letter asking for guidance from LIC office regarding the procedure for lodging a valid claim on natural demise/accidental death of the policy holder.</li><li>13 LIC granting/rejecting of the death claim.</li><li>14 LIC intimating the policy holder about lapsing of his policy.</li><li>15 LIC intimation to policy holder for revival of lapsed policy.</li></ol>	09	14
03	<p style="text-align: center;"><i>Selected Business Terms</i></p> <p>C.O.D.; C.W.O.; C.I.F.; F.O.B.; F.O.R.; E.&amp;O.E.; Cartage, Freight; Excise Duty; Custom Duty; V.A.T; Performa Invoice; Invoice; Trademark; Hypothecation; Ex - warehouse; Debit Note; Credit Note;</p>	09	14





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	Pilferage; Demurrage; Power of Attorney; Consignment, Bill of Lading; Bonded Warehouse; Certificate of origin; Advice Note; Letter of Credit (L/C); Warranty.		
04	<i>Agency Correspondence:</i> 1 Need of agents. 2 Agent as a Connecting link between Principal/ Manufacturer and the Consumer. 3 Kinds of Agents. 4 Letters between Principal and the Agents. 5 Agent applying for Agency. 6 Appointing of an agent by Principal. 7 Agent's suggestion to the principal for improving market share of the product. 8 Principal's reminder to the agent for improving sales in his territory. 9 Agent's demand for increase in commission and other facilities. 10 Termination of agency by the principal.	09	14
05	<i>Sales Letters</i> 1 Importance of Sales Letter OR Sales Letter as Ambassador of Businessmen. 2 A-I-D-C-A; Pattern. 3 Sales Letters on various white goods & daily utility products. eg. Washing machine; Television, Water purifiers, etc. Colour LCD; Two wheelers; four wheelers etc.	09	14

Reference / Text –Books / Additional Reading:

1. Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.
2. Media and Communication Management - C. S. Rayudu - Himalaya Publishing House, Bombay.
3. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.
4. Business Communication – Rai&Rai, Himalaya Publishing House, Mumbai
5. Business Communication – Homai Pradhan, Bhende D.S., Thakur Vijaya
6. Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.
7. Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.
8. Business Correspondence and Report Writing - R. C. Sharma, Krishna Mohan Tata McGraw-Hill Publishing Company Limited, New Delhi.
9. Business Communication and Organisational Management – Rohini Aggrawal – Taxman
10. Business Communication Strategies – Monipally Mathukutty M.- Tata McGraw Hill Publishing Company Limited, New Delhi.
11. Handbook of Communication – Narula Uma
12. A Handbook of Commercial Correspondence – A. Ashley – Oxford University Press.
13. Business Communication and Organizational and Management – C.B.Gupta.
14. Comprehensive Business Communication – Saroj Karnik, P.P.Mehta,-P.V.Kulkarni



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<b>B.C.A.</b> <b>Course:</b> Software Engineering <b>Course No:</b> BCA-CC-503 <b>Semester:</b> 05 <b>Type of Course :</b> Core Course <b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100 <b>Credits:</b> 03 <b>Theory Sessions per Week:</b> 03 <b>Teaching Hours:</b> 45 Hours			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction, Software Requirement Analysis &amp; Specification</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Define -Software &amp; Software Engineering</li><li>– Software Engineering Approach – Phase Development Process, Project Management</li><li>– Software Process &amp; It's Characteristics</li><li>– Software Development Process Models – Water Fall Model, Prototyping, Iterative Enhancement, Spiral Model</li><li>– Define Software Requirements</li><li>– Need For SRS</li><li>– Role of SRS</li><li>– Requirement Process -Problem Analysis ,Requirement Specifications, Validation</li></ul>		
<b>Unit-2</b>	<b>Software Planning &amp; Designing</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Team Structure – Egoless team, Chief Programmer Team, Controlled Decentralized Team</li><li>– Quality Assurance Plan – Verification &amp; Validation, Inspection &amp; Review</li><li>– Risk Management – types of risk management</li><li>– System Design principles.</li><li>– Module level concepts - Coupling &amp; Cohesion</li><li>– Design Methodology - Structure Chart</li><li>– Functional approach vs. Object Oriented Approach</li></ul>		
<b>Unit-3</b>	<b>Coding &amp; Testing</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Programming Practice</li><li>– Testing Fundamentals ( errors, fault &amp; failure)</li><li>– Levels of Testing</li><li>– Testing Methods</li></ul>		
<b>Unit-4</b>	<b>UML</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Fundamental of UML – Associations, Multiplicity, Qualified Association,</li><li>– Reflexive Association, Inheritance &amp; Generalization, Dependencies</li><li>– Component of UML – Class Diagram, Object Diagram, Use Case Diagram, Activity Diagram</li><li>– Case study –Library management system, ticket reservation system, hospital management system.</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. Pankaj Jalote: An Integrated Approach to Software Engineering, Narosa Publication</li><li>2. Joseph Schmuller: Teach Your Self UML in 24 Hours, Techmedia Publication</li><li>3. Roger Pressman: Software Engineering, McGraw-Hill Publication</li><li>4. Object Oriented Modeling and Designing with UML, Michael R Blaha &amp; James R Rumbaugh - Pearson</li></ol>			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
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<b>B.C.A. Course:</b> Web Application Development Using ASP.NET <b>Course No:</b> BCA-CC-504 <b>Semester:</b> 05 <b>Type of Course :</b> Core Course <b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100 <b>Credits:</b> 03 <b>Theory Sessions per Week:</b> 03 <b>Teaching Hours:</b> 45 Hours			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction and Basic Controls</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Introduction of IDE.</li><li>– Introduction of web forms &amp; Page event life cycle.</li><li>– Global application class &amp; web.config file.</li><li>– Advantages and features of asp.net.</li><li>– State management using view state, query string, session and cookies.</li><li>– Label, Button and Textbox.</li><li>– List Controls: Dropdownlist, listbox, checkbox list, radiobutton list, BulletedList.</li><li>– Radio button, checkbox.</li></ul>		
<b>Unit-2</b>	<b>Advance controls</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– File upload and Image control.</li><li>– Hyperlink, table, panel and wizard</li><li>– Navigation controls using menu, treeview and sitemap path.</li><li>– Validation Controls</li><li>– Ad Rotator</li><li>– Login Controls.</li><li>– Master Page, Theme and CSS.</li></ul>		
<b>Unit-3</b>	<b>Working with Database</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– ADO.NET architecture.</li><li>– Introduction of Server Explorer and its Features.</li><li>– Create database using sql server express and access with server explorer.</li><li>– Connectivity using code and sql data source.</li><li>– Data controls using grid view, form view, details view and data list control.</li></ul>		
<b>Unit-4</b>	<b>AJAX &amp; Web services</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Introduction of AJAX : History, Advantages, Application</li><li>– AJAX architecture.</li><li>– AJAX basic controls- ScriptManager, ScriptManagerProxy, UpdatePanel, UpdateProgress and timer.</li><li>– Introduction of web services.</li><li>– Create and deploy web services.</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. ASP.NET Black BOOK Published By Dreamtech Press</li><li>2. ASP.NET UNLEASHED By STEPHEN WALTHER</li></ol>			



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

<b>B.C.A.</b>	<b>Course: RDBMS using Oracle-I</b>	<b>Course No: BCA-CC-505</b>	
<b>Semester: 05</b>	<b>Type of Course : Core Course</b>		
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100			
<b>Credits: 03</b>	<b>Theory Sessions per Week: 03</b>	<b>Teaching Hours: 45 Hours</b>	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>DBMS AND RDBMS CONCEPTS &amp; INTRODUCTION TO ORACLE SERVER</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Overview of DBMS and RDBMS</li><li>– Three schema Architecture</li><li>– Data models: Hierarchical Model, Network model, Relational model.</li><li>– ORACLE Server &amp; Instances</li><li>– Database Structure &amp; Space Management</li><li>– Memory &amp; Process Structure</li><li>– Client Server Architecture – Distributed Database Processing</li><li>– How Oracle Works</li></ul>		
<b>Unit-2</b>	<b>BASIC SQL*PLUS</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>– Introduction of SQL, Characteristics of SQL.</li><li>– Basic Data Types of ORACLE, Oracle Operators.</li><li>– Data Definition Language (DDL)</li><li>– Data Manipulation Language (DML)</li><li>– Data Control Language (DCL)</li><li>– Transaction Processing Language (TPL)</li><li>– Query Generation using Clause: Where, Between, Distinct, Like, Order by, IN,NOTIN</li></ul>		
<b>Unit-3</b>	<b>ADVANCE SQL*PLUS-I</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Data Constrains</li><li>– Types of Data Constrains.</li><li>– In Built Functions: Aggregate, Numeric, String, Data/Time, Conversion.</li><li>– Grouping of Data</li></ul>		
<b>Unit-4</b>	<b>ADVANCE SQL*PLUS-II</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>– Sub queries and Types of Sub queries</li><li>– Join and types of join</li><li>– Union, Intersect and minus Clause</li><li>– Schema and Schema objects: View, Sequence, index, synonyms.</li></ul>		
<b>REFERENCE BOOKS</b>			
<ul style="list-style-type: none"><li>1. Learn Oracle 8i. By Jose A. Ramalho. Published by:BPB</li><li>2. SQL in 21-Days - Techmedia</li><li>3. PL/SQL in 21 Days - Techmedia</li><li>4. SQL, PL/SQL:THE PROGRAMMING LANGUAGE OF ORACLE By Evan Bayross</li></ul>			



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

<b>B.C.A.</b>	<b>Course:</b> Data Communication and Networking	<b>Course No:</b> BCA-CC-506	
<b>Semester:</b> 05	<b>Type of Course :</b> Core Course		
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100			
<b>Credits:</b> 03	<b>Theory Sessions per Week:</b> 03	<b>Teaching Hours:</b> 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Data Communication Fundamentals</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Introduction of Ancient, Electronic and Computerized Methods of Communication.</li><li>- Digital and Analog Data</li><li>- Data transmission Modes (Simplex, Half Duplex and Full Duplex)</li><li>- Types of Transmission media: Guided and Unguided</li><li>- Guided Transmission Media: Twisted Pair, Coaxial Cables, Fiber Optics.</li><li>- Unguided Transmission Media: Radio Waves and Micro Waves</li></ul>		
<b>Unit-2</b>	<b>Introduction to Computer Network , Local Area Network Technology and Networking Devices</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Meaning of the basic terms: – Network, Internetwork, Protocol.</li><li>- Types of Connection (Point to Point and Multipoint.)</li><li>- Types of Computer Network (LAN, MAN, WAN).</li><li>- Different types of Server: File Server, Application Server, Mail Server, Web Server, Database Server</li><li>- Introduction and Characteristics of LAN.</li><li>- LAN Topologies : Bus, Ring, Star, Tree, Mesh</li><li>- Functions of Various Networking Components: Repeater, Hub, Switch, Router, Bridge, and Gateway</li></ul>		
<b>Unit-3</b>	<b>Network Model</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Switching Technique: Circuit, Packet, and Message Switching</li><li>- Layered Tasks: Sender, Receiver.</li><li>- OSI Reference Model.</li><li>- Connection Less Vs Connection Oriented, Reliable Vs Unreliable Connections</li><li>- IP Packet Format and IP Addressing(IPV4)</li></ul>		
<b>Unit-4</b>	<b>Network Applications</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Domain Name System: DNS Basics, Characteristics, Working Of DNS, DNS Hierarchy.</li><li>- File Transfer Protocol: FTP Basics, FTP Modes, FTP Commands.</li><li>- Email: Email Basics, Email Structure, How Email Works?</li><li>- Email Protocol :SMTP,IMAP, MIME and POP</li><li>- HTTP Protocol &amp; UDP Protocol.</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. Data Communication and Networking, Author – Satish Jain / M. Jain, ISBN – 81-7656-484-2, BPB Publication.</li><li>2. Data Communication and Networking, Author – Behrouz Forouzan, Tata McGraw Hill Publication</li></ol>			



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



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Structure for B.C.A. – CBCS Programme

**Semester-VI (TY)**

<b>COURSE</b>	<b>COURSE</b>	<b>SUBJECT</b>	<b>CREDIT</b>
BCA-EC-601	ELECTIVE	Multimedia & Application	02
BCA-FC-602	FOUNDATION	Business Communication-VI	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
<b>TOTAL</b>			<b>28</b>



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





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**B.C.A.**  
**SEMESTER-VI**

Course No: FC-602 BUSINESS COMMUNICATION - VI

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
01	<i>Planning: Basic Managerial Activity.</i> 1 Introduction 2 Planning Defined. 3 Purpose of Planning. 4 The Basic Steps in Planning Process. 5 Types of Plans. 6 Advantages of Planning. 7 Limitation of Planning. 8 Principles of Planning.	09	14
02	<i>Notices, Agenda &amp; Resolutions:</i> 1 Types of Joint Stock Company Meetings. 2 Structure of a Notice. 3 Preparation of Agenda. 4 Types of Resolution and its drafting. 5 Notices & Agenda of the following Joint Stock Company Meetings: • First Board Meeting • Routine Board Meeting • Statutory Meeting • Extraordinary General meeting • Meeting held prior to A.G.M. • Annual General Meeting	09	14
03	<i>Minutes Writing :( Joint Stock Cos.)</i> 6 • First Board Meeting 7 • Routine Board Meeting 8 • Statutory Meeting 9 • Extraordinary General meeting 10 • Meeting held prior to A.G.M. 11 • Annual General Meeting	09	14
04	<i>Advertising Theory and Practice.</i> 1 What is Advertising–Advertising? 2 Advertising as a Tool of Communication. 3 Designing the Message. 4 Advertising as Brand Building. 5 Role of Advertising in Modern Business World. 6 Ethics in Advertising. 7 Benefits of Advertising to Advertisers & Consumers. 8 Types of Advertising- Media Selection and Planning. 9 Internet as a media of Advertisement.	09	14



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	10 The students have to prepare advertisement on Fast Moving Consumer Goods; White Goods in their own words about popular commodities and products available in market.		
05	<p><i>Insurance Correspondence: (Fire &amp; Marine)</i></p> <p>1 Types of Fire and marine policies.</p> <p>2 Losses and claims – Procedures involved in lodging of claims.</p> <p><u>Fire and Marine Insurance Letters:</u></p> <p>3 Letter requesting cover for goods against fire/marine hazard.</p> <p>4 Letter inviting a quotation for premium.</p> <p>5 Insurance Company quoting a rate of premium.</p> <p>6 Request for reduction in premium.</p> <p>7 Notice about increase in premium rates by Insurance Company.</p> <p>8 Lodging a claim for fire/marine policy.</p> <p>9 Letter granting/refusing a claim</p> <p>10 Letter contesting a claim made by policy holder.</p> <p><u>Note:</u> The above letters cover fire and marine insurance topics individually.</p>	09	14

Reference / Text –Books / Additional Reading:

1. Business Communication - K. K. Sinha - Galgotia Publishing Company, New Delhi.
2. Media and Communication Management - C. S. Rayudu - Himalaya Publishing House, Bombay.
3. Essentials of Business Communication - Rajendra Pal and J. S. Korlhalli - Sultan Chand & Sons, New Delhi.
4. Business Communication – Rai&Rai, Himalaya Publishing House, Mumbai
5. Business Communication – Homai Pradhan, Bhende D.S., Thakur Vijaya
6. Business Communication (Principles, Methods and Techniques) Nirmal Singh - Deep & Deep Publications Pvt. Ltd., New Delhi.
7. Business Communication - Dr. S.V. Kadvekar, Prin. Dr. C. N. Rawal and Prof. Ravindra Kothavade - Diamond Publications, Pune.
8. Business Correspondence and Report Writing - R. C. Sharma, Krishna Mohan Tata McGraw-Hill Publishing Company Limited, New Delhi.
9. Business Communication and Organizational Management – Rohini Aggrawal – Taxman
10. Business Communication Strategies – Monipally Mathukutty M.- Tata McGraw Hill Publishing Company Limited, New Delhi.
11. Handbook of Communication – Narula Uma
12. A Handbook of Commercial Correspondence – A. Ashley – Oxford University Press.
13. Business Communication and Organizational and Management – C.B.Gupta.
14. Comprehensive Business Communications – Saroj Karnik, P.P.Mehta,-P.V.Kulkarni



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<b>B.C.A.</b> <b>Course:</b> Network Security <b>Course No:</b> BCA-CC-603			
<b>Semester:</b> 06 <b>Type of Course :</b> Core Course			
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100			
<b>Credits:</b> 03 <b>Theory Sessions per Week:</b> 03 <b>Teaching Hours:</b> 45 Hours			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Network Security Fundamental.</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Concept of Computer Security, Challenges of Computer Security.</li><li>- The OSI Security Architecture.</li><li>- Types of Security Attacks: Active Attacks and Passive attacks</li><li>- Security Services: Authentication, Access Control, Data Confidentiality, and Data Integrity.</li><li>- A Model for Network Security.</li></ul>		
<b>Unit-2</b>	<b>Cryptography</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Concept of Cryptography.</li><li>- Basic terms: Cryptography, Plaintext, Cipher text, Cipher, Key, Encryption and Decryption.</li><li>- Cryptography Keys: Public Key and Private Key</li><li>- Types of Cryptography: Symmetric key, Asymmetric key Cryptography.</li><li>- Symmetric Cryptography: Substitutional and Transposition Cipher.</li></ul>		
<b>Unit-3</b>	<b>Network Device Securities and E-Mail</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Switch.</li><li>- Router.</li><li>- Network Management System.</li><li>- Administrative Practice.</li><li>- Centralize Account Management.</li></ul>		
<b>Unit-4</b>	<b>IP Security, Firewall and IP Security</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- E-mail Security: S/MIME.</li><li>- IP Security Overview.</li><li>- IP Security Architecture.</li><li>- Application and Benefits of IP Security.</li><li>- IP Security Services.</li><li>- Firewall: Introduction, Need for Firewall, Characteristics.</li><li>- Types of Firewall.</li><li>- Introduction to Virtual Private Network.</li><li>- VPN Protocol.</li><li>- Introduction to Wireless Network Security</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. Cryptography and Network Security, - William Stallings Person – Printice Hall Publication</li><li>2. Data Communication and Networking, - Author – Behrouz Forouzan, Tata McGraw Hill Publication</li></ol>			



<b>B.C.A.</b>		<b>Course: Core Java</b>	<b>Course No: BCA-CC-604</b>	
<b>Semester: 06</b>		<b>Type of Course : Core Course</b>		
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation : 30 = 100				
<b>Credits: 03</b>		<b>Theory Sessions per Week: 03</b>	<b>Teaching Hours: 45 Hours</b>	
<b>Unit</b>	<b>Detailed Syllabus</b>	<b>Teaching Hours</b>	<b>Marks/Weight</b>	
<b>Unit-1</b>	<b>Introduction to Java</b>	<b>12</b>	<b>18</b>	
	<ul style="list-style-type: none"><li>- History of Java, Features of Java, Applications of Java, Java Virtual Machine (JVM) and Byte Code, Buzz Words.</li><li>- Basics Concept of OOP: Abstraction and Encapsulation, Inheritance and Polymorphism</li><li>- Comparison Between C++ and Java.</li><li>- Data types, Operators.</li><li>- Control Statement, Array, and command line argument.</li><li>- Structure of Java Programming.</li></ul>			
<b>Unit-2</b>	<b>Programming in Java</b>	<b>11</b>	<b>18</b>	
	<ul style="list-style-type: none"><li>- Classes, Objects and Methods.</li><li>- Polymorphism: Method Overloading.</li><li>- Constructor: Concept of Constructor, Types of Constructor, Constructor Overloading.</li><li>- Garbage Collection, Finalize() Method.</li><li>- The 'this' keyword.</li><li>- 'static' and 'final' keyword.</li><li>- Access Control: Public, Private, Protected, Default.</li></ul>			
<b>Unit-3</b>	<b>Inheritance and Packages</b>	<b>11</b>	<b>17</b>	
	<ul style="list-style-type: none"><li>- Inheritance Basic, Types of Inheritance.</li><li>- Uses of 'super' keyword.</li><li>- Method Overriding.</li><li>- Run Time Polymorphism: Dynamic Method Dispatch.</li><li>- Abstract Method and Class.</li><li>- 'final' Keyword with Inheritance.</li><li>- Defining Package, Understanding of CLASSPATH.</li><li>- Importing Packages.</li><li>- Access Protection</li></ul>			
<b>Unit-4</b>	<b>Interface , Exception Handling and Multi Threading Programming</b>	<b>11</b>	<b>17</b>	
	<p>Interfaces: Defining Interface, Implementing Interface.</p> <ul style="list-style-type: none"><li>- Implementation of Multiple and Hybrid Inheritance using Interface.</li><li>- Extending Interface</li><li>- Exception Handling Fundamentals, Types of Exceptions.</li><li>- Try...catch Keyword, Multiple Catch Statements.</li><li>- Throw, Throws, Finally Keywords.</li><li>- Concept of Multi Threading, Thread Life Cycle.</li><li>- The main Thread.</li><li>- Creating Thread, Multiple Thread</li><li>- Thread Priorities.</li></ul>			
<b>Reference Book</b>				
<ol style="list-style-type: none"><li>1. Complete Reference Java by Herbert Schildt Publisher:TMH</li><li>2. Programming in JAVA by E-Balaguruswami</li><li>3. Java Programming Reference by Grant Palmer.</li></ol>				



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<b>B.C.A. Course: RDBMS using Oracle-II Course No: BCA-CC-605</b>			
<b>Semester: 06 Type of Course : Core Course</b>			
<b>Marking Scheme: External Examination: 70 + Internal Evaluation : 30 = 100</b>			
<b>Credits: 03 Theory Sessions per Week: 03 Teaching Hours: 45 Hours</b>			
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>UNIT-1</b>	<b>Basic PL/SQL Programming</b>	<b>12</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- PL/SQL Block Structure</li><li>- Control Structure</li><li>- Implicit Cursor Programming</li><li>- Explicit Cursor Programming</li><li>- Parameterize Cursor and Cursor For loop</li></ul>		
<b>UNIT-2</b>	<b>Advance PL/SQL Programming</b>	<b>11</b>	<b>18</b>
	<ul style="list-style-type: none"><li>- Exception Handling</li><li>- Stored Procedure and Function</li><li>- Trigger</li><li>- Data Concurrency and locking</li><li>- Package</li></ul>		
<b>UNIT-3</b>	<b>INTRODUCTION TO DBA and DBA Activity</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Role of DBA.</li><li>- Users: Creating a new user, grant command, deleting user.</li><li>- Privileges: System privileges, object privileges, Assigning object privileges to a user, Viewing User &amp; privileges, revoking a system &amp; an object privileges.</li><li>- Role: Creating a role, Granting privileges &amp; roles to a role, granting role to a user, viewing the role of a user.</li><li>- Database Backup and Recovery</li><li>- Types of Failure</li><li>- Data structure used for Database recovery</li></ul> Import and export		
<b>UNIT-4</b>	<b>Data warehousing and Data Mining</b>	<b>11</b>	<b>17</b>
	<ul style="list-style-type: none"><li>- Data ware housing Definition, usage and trends</li><li>- DBMS vs. data warehouse, Data marts, Metadata</li><li>- Data warehouse architecture</li><li>- Design and construction of data warehouse</li><li>- Introduction to data mining</li><li>- Classification and Applications of data mining system</li></ul>		
<b>REFERENCE BOOKS</b>			
<ol style="list-style-type: none"><li>1. Data Warehousing, Data Mining and OLTP; Alex Berson, 1997, McGraw Hill.</li><li>2. Learn Oracle 8i. By Jose A. Ramalho. Published by:BPB</li><li>3. SQL in 21-Days - Techmedia</li><li>4. PL/SQL in 21 Days - Techmedia</li><li>5. SQL, PL/SQL:THE PROGRAMMING LANGUAGE OF ORACLE By Evan Bayross</li></ol>			



<b>B.C.A.</b>	<b>Course:</b> Project Work	<b>Course No:</b> BCA-CC-606
<b>Semester:</b> 06	<b>Type of Course :</b> Core Course	
<b>Marking Scheme:</b> External Examination: 70 + Internal Evaluation: 30 = 100 <b>Credits:</b> 03		
<b>Detailed Syllabus</b>		
<p>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.</p> <p>Internal Evaluation scheme: 30 Marks</p> <p>Submission of project proposal</p> <p>Progress Report every month (3 Progress Report)</p> <p>Term End Evaluation 70 Marks:</p> <p>PROJECT REPORT EVALUATION – 30 MARKS</p> <p>ACTUAL PROJECT EVALUATION AND VIVA – 40 MARKS</p>		
<b>Preparing project report</b>		
Student have to prepare project report according given suggestive structure of project report.		
<p>Title page</p> <p>Certificate of work</p> <p>Acknowledgment</p> <p>Table of content</p> <p>Table of Figures</p> <p>Chapter-1 (Introduction)</p> <p>Background, Objective, purpose , scope , applicability</p> <p>Chapter-2 (Requirement And Analysis)</p> <p>Problem definition, Requirement specification, Hardware Software Requirement.</p> <p>Planning and Scheduling</p> <p>Chapter-3 System design</p> <p>Over all System design using designing Tools</p> <p>Data Dictionary</p> <p>Input /Output Design</p> <p>Chapter -4 Testing and implementation</p> <p>Testing Approach used</p> <p>Test cases</p> <p>Implementation Approaches</p> <p>Chapter-5</p> <p>Conclusion</p> <p>Limitation of system</p> <p>Future Scope of system</p> <p>Bibliography</p>		
Student have to prepare 2 – copies of report , 1 <sup>st</sup> copy has to submit in college for evaluation ( must be in hard binding) and 2 <sup>nd</sup> copy for personal reference.		



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