



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2016-17)**

**BACHELOR OF SCIENCE -INFORMATION TECHNOLOGY (B.Sc.(IT))**

**Semester-I (FY)**

COURSE NO.	COURSE TYPE	SUBJECT	CREDIT
B.Sc.(IT)-EC-101	ELECTIVE	Environmental Science – I	02
B.Sc.(IT)-FC-102	FOUNDATION	Introduction to English Language and Literature – I	02
B.Sc.(IT)-CC-103	CORE	Fundamental of IT	03
B.Sc.(IT)-CC-104	CORE	Introduction of C Language	03
B.Sc.(IT)-CC-105	CORE	Open Office	03
B.Sc.(IT)-CC-106	CORE	Computer Oriented Mathematics	03
B.Sc.(IT)-CC-107	CORE	Practical (Based on B.Sc.(IT)-CC-104) (Based on B.Sc.(IT)-CC-105)	12
<b>TOTAL</b>			<b>28</b>

**Internal Continuous Evaluation:**

1. There will be Internal Continuous Evaluation in Theory papers of Core Course.
2. There will be 30 marks for Assignments in Course No: B.Sc.(IT)-CC-103, B.Sc.(IT)-CC-104, B.Sc.(IT)-CC-105, B.Sc.(IT)-CC-106



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B.Sc.(IT)	Course: Environmental Science - I	Course No: B.Sc.(IT)-EC-101
Semester: 01	Type of Course: Elective Course	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100 Marks		
Credits: 02	Theory Sessions per Week: 02	Teaching Hours: 30 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Natural resources	06	20
	<ul style="list-style-type: none"><li>- Introduction</li><li>- Types of natural resources</li><li>- a. Renewable b. non renewable resources</li><li>- Natural resources and associated problems.</li><li>- Renewable resources -1 : Forest<ul style="list-style-type: none"><li>Forest types in India</li><li>Deforestation</li><li>Forest functions</li><li>Threats to the forest in India</li></ul></li></ul>		
Unit-2	Renewable resources-2: Water	06	20
	<ul style="list-style-type: none"><li>- Over-utilization and pollution of surface and Undergroundwater.</li><li>- Effect of Global climate change on water management.</li><li>- Water for agriculture and power generation.</li><li>- Sustainable water management.</li></ul>		
Unit-3	Renewable resources- 3: Energy	06	20
	<ul style="list-style-type: none"><li>- Hydroelectric power, Solar energy</li><li>- Biomass energy, Wind power</li><li>- Tidal and wave power</li><li>- Nuclear power</li><li>- Energy conservation</li></ul>		
Unit-4	Ecosystem	06	20
	<ul style="list-style-type: none"><li>- Producers consumers and decomposers</li><li>- Foodchain food webs and ecological pyramids</li><li>- Forest ecosystem</li><li>- Desert ecosystem</li><li>- Aquatic ecosystem</li><li>- Fresh water and Marine ecosystem</li></ul>		
Unit-5	Biodiversity	06	20
	<ul style="list-style-type: none"><li>- Value of biodiversity</li><li>- Consumptive use value</li><li>- Productive use value</li><li>- Social value</li><li>- Ethical and moral values</li><li>- Aesthetic value</li><li>- Option value</li><li>- India as a mega diversity nation</li><li>- Threats to biodiversity</li></ul>		

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



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B.Sc.(IT)	Course: Introduction to English Language and Literature - I	Course No: B.Sc.(IT)-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: 30 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Study of Short Stories	06	20
	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)		
Unit-2	Study of Poetry	06	20
	Beauty – John Masefield Old Familiar Faces – Charles Lamb To the Cuckoo – William Wordsworth (Short notes 2/3 each in 500 words approximately)		
Unit-3	Parts of Speech	06	20
	Jupp and Milne Grammar Book Chapter 1 only		
Unit-4	Tenses	06	20
	Introduction of Tenses Giving Personal Information		
Unit-5	Vocabulary	06	20
	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.



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B.Sc.(IT)	Course:- Fundamental Of IT	Course No: B.Sc.(IT)-CC-103
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	Introduction to computers	09	14
	Definition of computer Block Diagram of computer Characteristics of computer Generation of computer Digital computer, mini, micro, mainframe, super Hybrid compute, Data representation & Number system.		
Unit-2	Computer Peripherals	09	14
	Input Devices: Keyboard, Mouse, Joystick, Track ball, Touch Screen, OCR, OMR, MICR & OBR, Light pen, Scanner, Output Devices (All): Visual Display Unit (VDU), LCD, Plasma, Printers: Impact, Non Impact, Plotter, Storage Devices & Type of Memory: RAM, ROM, PROM, EPROM, EEPROM, cache memory, CDs, DVD, BRD, Pen Drive		
Unit-3	Concepts in information & Processing	09	14
	An overview of information technology applications, Difference between Data & Information, Information system, Value of Information, Quality of Information Software Concepts: Types of Software, Programming Languages, Software (Its Nature & Qualities), Programming Languages.		
Unit-4	Internet technology & World wide web	09	14
	Introduction to Web, Internet requirement, Internet – A global Network, Host & Terminals, TCP/IP, Common protocols used in Internet, World wide web, Web browsers, Internet addresses, Domain names, Basic concepts of HTML, Web Search engines Electronic Mail		
Unit-5	Overview Computer Language & OS	09	14
	What is machine level language, What is assembly level language, What is high level language. (Note: there is no any comparison in between these language) (Just) Definition of Assembler, compiler & interpreter Operating Systems: History & Evolution, A Brief History of Linux, A Brief History of MSDOS, A Brief History of Windows System		

**Reference Books:**

1. Computer Fundamentals-P.K. Sinha
2. Fundamentals Of Computers, 3rd Edition -V. Rajaraman



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B.Sc.(IT) Semester: 01 Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100 Marks Credits: 03	Course: Introduction of C Language Type of Course: Core Course Theory Sessions per Week: 03	Course No: B.Sc.(IT)-CC-104 Teaching Hours: 45 Hours
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Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Programming Language Fundamentals	09	14
	Flowchart and Algorithm Introduction to programming language and types of programming language Concept of Editor, Compiler, Interpreter, Translator, Assembler Getting started with C:History, Structure of C program, Compilations & linking C program Character Set, Keywords, Identifier, Data Type, Variable and Constant		
Unit-2	Programming Constructs	09	14
	Formatted Input and output statements Operators Decision making and Branching (If, if-else, switch etc) Looping construct (While loop, Do..While loop, For loop etc) Break, Continue, go to and exit		
Unit-3	Array and sorting searching technique	09	14
	Introduction of array Declaration and initialization of 1-D and 2-D arrays Programming using 1-D and 2-D Array Sorting method(selection, bubble), Searching method (linear, Binary)		
Unit-4	Character, String Handling and Built-in Function	09	14
	Declaration and initialization of string and character data Character and string operation Character and String handling Function Built-in Function: math's, input output function etc		
Unit-5	Functions	09	14
	Concept of modular programming Elements of function, Type of Function Declaration, Calling, and Defining a function. Passing Array and string as function argument		

**Reference Books**

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



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B.Sc.(IT)	Course: Open Office	Course No: B.Sc.(IT)-CC-105
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	<b>Introduction</b>	09	14
	Introduction to personal computers : Characteristics of computer, Types of computer Overview of Basic Operation System : Introduction of Dos and Windows operating system Introduction to editors : DOS – Internal and External Commands Windows Environment : Desk top, file, folders, icons, Window explorer, control panel, Windows Accessories		
Unit-2	<b>Word Processing Package</b>	09	14
	Introduction to word processing, Examples of some popular WP packages. Uses of word processors, Word Processor – Examples – Uses of WP Creation, editing, formatting of Documents. Global Search & Replacement of text. Special printing features, Mail merge Facilities, Spelling checker, Table facility, Templates, advanced features. Inserting Pictures, Drawing and Equation, Macros.		
Unit-3	<b>Spreadsheet Package-I</b>	09	14
	Introduction to Spreadsheet Examples of some popular Spreadsheet packages. User of spreadsheet packages. Building Spreadsheet using formulas, conditional calculations, and built-in functions. Use of Conditional Formatting through formula or in-built function Writing macros and spreadsheet menus to build a user-interface		
Unit-4	<b>Spreadsheet Package-II</b>	09	14
	Graph-plotting facilities, Use externally created data lies in the spreadsheet packages. What-if analysis, protection facility, Pivot Tables, Operation on tables. Macros with its all options (Creating, running and Saving in the worksheet(s) with Data with spreadsheets) Application of Spreadsheets		
Unit-5	<b>Presentation Package</b>	09	14
	Preparing presentation, Formatting Slides. Slide transition, adding special effects Inserting Pictures, Sound and Chart. Slide Design Animation in Slide		

**Reference Books**

1. A conceptual guide to open office.org R. Gabriel Gurely



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B.Sc.(IT)	Course: Computer Oriented Mathematics	Course No: B.Sc.(IT)-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	<b>Set and function</b>	09	14
	<p><b>SET THEORY:</b> Introduction to set theory, basic definition            Methods of representation of a set            Operations on set (union, intersection, complement of set, difference of sets, symmetric difference, Cartesian product of sets)            Properties of set operation ( cumulative, associative, distributive, De Morgan's law)  <b>FUNCTION:</b> Definition, Domain, co-domain, range, one-to-one function, onto function, Composite function and inverse of a function.</p>		
Unit-2	<b>Vector and Matrices</b>	09	14
	<p><b>Vector:</b> Definition of Vector, Addition and Subtraction of Vectors            Magnitude of a Vector, Unit Vectors, Dot Product and Cross Product.  <b>Matrices:</b> 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, Rank of a Matrix, Solution of Linear Equations using Matrices</p>		
Unit-3	<b>Permutation, Combination &amp; Algorithms</b>	09	14
	<p>Meaning of permutation, Formula of permutation, Permutation of n-different things, Permutation of similar things, Permutation of repeated things,            Circular Permutation            Combination: Meaning of Combination, Formula of Combination.            Algorithm: Set Operations. Vector Addition, Subtraction and Dot Product.            Algorithm: Matrix Addition, Matrix Multiplication.            Algorithm: Permutation &amp; Combination.</p>		



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Unit-4	<b>Sequence and Series</b>	09	14
	Introduction Arithmetic Progression Formula for Sum to $n$ Terms of an A.P. Geometric Progression Sum to $n$ Terms of a G.P. Arithmetic – Geometric Progression (A.G.P.) Harmonic Progression (H.P.) Sum of First $n$ Natural Numbers, Their Squares and Cubes		
Unit-5	<b>Graph Theory</b>	09	14
	Introduction to Graph, 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, Operation on Graph (Union, Intersection and Complement). Tree Definition, Rooted Tree, Binary tree and its properties, Uses of Binary Tree. Level of a tree. Matrix Representation of a Tree (Incidence Matrix and Adjacency Matrix).		

<b>Reference Books</b>	
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	

B.Sc.(IT)	Course: Practical	Course No: B.Sc.(IT)-CC-107
Semester: 01	Type of Course: Core Course	
Marking Scheme: External Examination: 100 + Internal Examination: 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.Sc.(IT)-CC-104	50
Unit-2	Practical Problem from B.Sc.(IT)-CC-105	50





**BACHELOR OF SCIENCE - INFORMATION TECHNOLOGY (B.Sc.(IT))**

**Semester-II (FY)**

COURSE NO.	COURSE TYPE	SUBJECT	CREDIT
B.Sc.(IT)-EC-201	ELECTIVE	Environmental Science – II	02
B.Sc.(IT)-FC-202	FOUNDATION	Introduction to English Language and Literature - II	02
B.Sc.(IT)-CC-203	CORE	Principles of Digital Electronics	03
B.Sc.(IT)-CC-204	CORE	Advanced C Programming	03
B.Sc.(IT)-CC-205	CORE	Internet and Web Technology	03
B.Sc.(IT)-CC-206	CORE	Network Management & Information Security	03
B.Sc.(IT)-CC-207	CORE	Practical (Based on B.Sc.(IT)-CC-204) (Based on B.Sc.(IT)-CC-205)	12
<b>TOTAL</b>			<b>28</b>

**Internal Continuous Evaluation:**

1. There will be Internal Continuous Evaluation in Theory papers of Core Course.
2. There will be 30 marks for Assignments in Course No: B.Sc.(IT)-CC-203, B.Sc.(IT)-CC-204, B.Sc.(IT)-CC-205, B.Sc.(IT)-CC-206



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B.Sc.(IT)	Course: Environmental Science - II	Course No: B.Sc.(IT)-EC-201
Semester: 02	Type of Course: Elective Course	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100 Marks		
Credits: 02	Theory Sessions per Week: 02	Teaching Hours: 30 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Climate change	06	20
	<ul style="list-style-type: none"> <li>– Global warming</li> <li>– Case study of globalwarming</li> <li>– Acid rain and Case study of Acid rain</li> <li>– Ozon layer depletion and Case study of Ozon layer depletion</li> </ul>		
Unit-2	Pollution	06	20
	<ul style="list-style-type: none"> <li>– Air pollution, Water pollution, Noise pollution</li> <li>– Pollution case study</li> <li>– Minamata disease</li> <li>– Ground water pollution, Pesticides pollution, River pollution in India.</li> </ul>		
Unit-3	Disaster Management	06	20
	<ul style="list-style-type: none"> <li>– Floods, Earthquake, Cyclones, Landslide</li> </ul>		
Unit-4	Social issues and the environment	06	20
	<ul style="list-style-type: none"> <li>– Unsustainable to sustainable development</li> <li>– Water conservation :</li> <li>– Rain water harvesting</li> <li>– Water shed management</li> <li>– The air (prevention and control of pollution) Act</li> <li>– The water (prevention and control of pollution) Act</li> <li>– The wildlife (protection ) Act</li> <li>– Using an environmental calender of activities</li> </ul>		
Unit-5	Population Growth and the Environment	06	20
	<ul style="list-style-type: none"> <li>– Population growth variation among nation</li> <li>– Population explosion : family welfare programme</li> <li>– Methods of sterilisation</li> <li>– Urbanization</li> <li>– Urban poverty and environment</li> <li>– Environment and human health</li> <li>– Bhopal gas incident</li> <li>– Climate and health</li> <li>– Infectious disease</li> <li>– Globalization and Infectious disease</li> <li>– Water born disease</li> <li>– Water scarecity diseases</li> <li>– Diarrhea</li> <li>– Cancer and the environment</li> </ul>		

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



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B.Sc.(IT)	Course: Introduction to English Language and Literature - II	Course No: B.Sc.(IT)-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: 30 Hours

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
Unit-1	Study Poems and Prose	06	20
	Daybreak – Henry Longfellow Beautiful Things – Ellen P. Allerton The Sun and the Planets – C. Jones (Short notes 2/3 each in 500 words approximately)		
Unit-2	Study Poems and Prose	06	20
	Climbing Everest – B. Mathur Gold Frame – R. K. Narayan The Tiger Smiled – Jim Corbet (Short notes 2/3 each in 500 words approximately)		
Unit-3	Improve Business English	06	20
	Use of Internet Chapter 1 only from 50 Ways to Improve Business English Using the Internet Introduction of email		
Unit-4	Professionalism	06	20
	personal and Food Etiquette Professions and occupations		
Unit-5	Grammar	06	20
	Introduction of Verb Forms Introduction of Modal Auxiliary Verbs		

**Reference Books**

1. Practical English Prose and Verse (Ed) G. E. B. Coe, Orient Longman, 1981
2. Learning English, A Rama Krishna Rao, Orient Blackswan, 2008
3. Hundred Poems, Lok Milap Publication, Bhavnagar, 1994
4. Palgrave, F. T., 'The Golden Treasury', Rupa & Co, 2001
5. Modern Short Stories, (Ed) Khan, M. Q , OUP, 1999
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. Poetry for Pleasure, (Ed)Maung Kaung, OUP, New Delhi, 2005



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B.Sc.(IT)	Course: Principal of Digital Electronics	Course No: B.Sc.(IT)-CC-203
Semester: 02	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	<b>Gates and Boolean Algebra</b>	09	14
	Introduction to Gates Boolean Algebra (Basic Theorem and Properties) and Truth Table Laws of Boolean Algebra Preparing Circuit from Boolean Function De – Morgan’s Theorem		
Unit-2	<b>Logic Simplification and Basic Digital Circuits</b>	09	14
	Simplification of Boolean Algebra and Gate Minimization Preparing truth table from circuit Preparing circuit for given truth table(SOP and POS) Universal Gates [NAND and NOR Gate] Circuit implementation using Universal gates		
Unit-3	<b>Combinational Circuits</b>	09	14
	Integrated Circuit Encoder and Decoder Multiplexer De Multiplexer Comparator		
Unit-4	<b>Arithmetic Circuits</b>	09	14
	Adders : Half Adder and Full Adder Subtractors : Half Subtractor and Full Subtractor Binary Adder Binary Adder/Subtractor Shifter		
Unit-5	<b>Registers and Counters</b>	09	14
	Latches Flip Flop : RS Flip Flop, D Flip Flop, JK Flip Flop , T Flip Flop Registers : Buffer Register and Shift Register Counters : Asynchronous Counter (Ripple), Synchronous Counter		

**Reference Books**

1. Digital Computer Electronics – Albert Paul Malvino
2. Digital Logic and Computer Design – M. Morris Mano



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B.Sc.(IT)	Course: Advanced C Programming	Course No: B.Sc.(IT)-CC-204
Semester: 02	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	Structure and Union	09	14
	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	09	14
	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	09	14
	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	09	14
	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()		
Unit-5	Pre-processors and Bit-wise operators	09	14
	Introduction to pre-processors : #define, #include Bit-wise operators Applications of bit-wise operators		

<b>Reference Books</b>
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.



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B.Sc.(IT)	Course: Internet and Web Technology	Course No: B.Sc.(IT)-CC-205
Semester: 02	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	Fundamentals of Internet	09	14
	Introduction to Internet, Intranet, Extranet Introduction to Internet Connection : Dial up connection, Direct Connection, Broadband Connection Introduction to Internet address, URL, ISP Email and its protocol: SMTP, POP3, IMAP		
Unit-2	Introduction to HTML	09	14
	Basics of HTML HTML document structure tags HTML comments Text formatting tags Inserting special characters Hyperlink and its types Lists and its types Working with image		
Unit-3	Advanced HTML	09	14
	Creating Tables Developing Forms Working with frames and floating frames (iframe) Meta tags Embedded multimedia		
Unit-4	Design and Develop web pages using CSS	09	14
	Introduction to DHTML Difference between HTML and DHTML Introduction to CSS Applying stylesheet to a document : Inline stylesheet, External stylesheet, Importing stylesheet, Embedding stylesheet CSS Properties: Font, Text, Margin, Padding, Color, Border, List, Background		
Unit-5	Application of Internet	09	14
	WWW, Search Engine, Newsgroup, Audio and Video conferencing, Web Chat, IRC, FTP, Remote Login, DNS Introduction to eCommerce, eLearning, eBanking Introduction to social networking- Twitter, Facebook		

**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



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B.Sc.(IT)	Course: Network Management & Information Security	Course No: B.Sc. (IT)-CC-206
Semester: 02	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	Introduction to Information Security	09	14
	Attributes of Information Security: Confidentiality, Integrity, and Availability. Threats & Vulnerabilities: Unauthorized Access, Impersonation, Denial of Service, Malicious Software; Trap Doors, Logic Bomb, Trojan Horses; Viruses, Worms & Bacteria; Security Strategies & Processes; Importance of Security Policies and Audits.		
Unit-2	Network Security -I	09	14
	OSI Model, Maximum Transfer Unit, IP, TCP, UDP, ICMP; ARP, RARP and DNS; Ping, Traceroute. Security Services : Message Confidentiality, Integrity, Authentication, nonrepudiation Message Confidentiality : confidentiality with symmetric key & Asymmetric key		
Unit-3	Network Security - II	09	14
	Network Attacks: Buffer Overflow, IP Spoofing, TCP Session Hijacking, Sequence Guessing, Network Scanning: ICMP, TCP sweeps, Basic Port Scans; Denial of Service Attacks: SYN Flood, Teardrop attacks, land, Smurf Attacks. Virtual Private Network Technology: Tunneling, IPSEC: Traffic Protocols: Authentication Headers, ESP Internet Key Exchange (IKE), Security Association PPTP, L2TP.		
Unit-4	Identification & Authentication	09	14
	Definitions, Types of authentication, Password Authentication, Password Vulnerabilities & Attacks: Brute Force & Dictionary Attacks. Password Policy & Discipline, Single Signon - Kerberos, Alternate Approaches: Biometrics: Types of Biometric Techniques: False Rejection, False Acceptance, Cross Over Error Rates..		
Unit-5	Internet Security	09	14
	. Proxy Servers, Firewalls, , Smurf Attacks on ISP : How Virus works on Internet, How Cookies, Passports and Web Tracking Work, , Privacy and Digital Certificates, Parental Controls on the Internet		
<b>Reference Books</b>			
1. William Stallings, "Network Security Essentials" 2. Behrouz A Forouzan " Data Communication And Networking" 3. Professional Reference, "Internet Security" 4. Gollmann, Dieter, "Computer Security"			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2016-17)**

B.Sc.(IT)	Course: Practical (Based on B.Sc.(IT)-CC-202)	Course No: B.Sc.(IT)-CC-207
Semester: 02	Type of Course: Core Course	
Marking Scheme: External Examination: 100 + Internal Examination: 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.Sc.(IT)-CC-204	50
Unit-2	Practical Problem from B.Sc.(IT)-CC-205	50





**CHOICE BASED CREDIT SYSTEM**  
Credit and Semester System Syllabus

**BACHELOR OF SCIENCE - INFORMATION TECHNOLOGY (B.Sc.(IT))**

**Semester-III (SY)**

Course No.	Course Type	Subject	Credit
B.Sc.(IT)-EC-301	ELECTIVE	DISASTER MANAGEMENT	02
B.Sc.(IT)-FC-302	FOUNDATION	ENGLISH	02
B.Sc.(IT)-CC-303	CORE	DATA AND FILE STRUCTURE USING C	03
B.Sc.(IT)-CC-304	CORE	PROGRAMMING IN C++	03
B.Sc.(IT)-CC-305	CORE	SYSTEM ANALYSIS AND DESIGN	03
B.Sc.(IT)-CC-306	CORE	OPERATING SYSTEM-I	03
B.Sc.(IT)-CC-307	CORE	PRACTICAL (BASED ON 303 AND 304)	12
<b>Total</b>			<b>28</b>

Internal Continuous Evaluation:

1. There will be Internal Continuous Evaluation in Theory papers of Core Course.
2. There will be 30 marks for Assignments in Course No: B.Sc.(IT)-CC-303, B.Sc.(IT)-CC-304, B.Sc.(IT)-CC-305, B.Sc.(IT)-CC-306



B.Sc. (I.T.)  
Semester - III

EC: 301: Disaster Management

Credits: 02

Marks: 100 Marks

Semester End Examination of 70 Marks

Continuous Internal Evaluation: 30 Marks

Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
1	<p><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.</p>		
2	<p><b>Land slide</b> Causes of landslide, Types of landslide Sliding forces, Clues to land slides Prevention of landslides, Damage caused by land slide. <b>Tsunami</b> Introduction Tsunami in India, Precautions taken during Earthquake Destruction caused by tsunami</p>		
3	<p><b>Flood</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>Rain Water Harvesting</b> Introduction Need for rain water harvesting, Method for rain water harvesting</p>		
4	<p><b>Cyclone</b> Introduction</p>		



	Cyclones of India, Cyclones prone areas of India Destruction caused by cyclones <b>Fire and Fire Prevention</b> Precaution for fire, What to do and not to do during fire. Fire safety Management.		
5	<b>Drought</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		

**:: 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.



**B.Sc. (IT)  
SEMESTER - III**

**FOUNDATION COURSE:**

**FC-302: English**

**Credit: 03**

Unit: 1

14 Marks

- (a) The Road Not Taken: Robert Frost
- (b) The Felling of the Banyan Tree: Dilip Chitre
- (c) No Men Are Foreign: James Kirkup

Unit: 2

14 Marks

- (a) Situational conversation
- (b) Telephone etiquette and work etiquette

Unit: 3

14 Marks

- (a) Eponymy
- (b) The story behind idioms and phrases

Unit: 4

14 Marks

- (a) Preparing Advertisement for consumer Items
- (b) Preparing Pamphlets for a social cause

Unit 5

14 Marks

- (a) Expansion of Ideas
- (b) Precis writing

**Texts and references:**

1. 'Prism' Board of Editors Orient Blackswan 2011
2. Sinha, k.K. Business Communication. Galgotia Publishing Company, New Delhi.
3. Advanced English Grammar – by Martin Hewings. Cambridge Uni. Press. 1999.
4. Green, David. Contemporary English Grammar Structures and Composition. Macmillan.
5. Amazing English Anish Goerge Issac's Publication



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

B.Sc IT			
Course: Data And File Structure Using C		Course No: B.Sc IT-CC-303	
Semester: 03		Type of Course : Core Course	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100			
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction to data structure</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Data Structure – Definition</li><li>• Classification of Data Structure</li><li>• Primitive and Composite data types represent Data Structure</li><li>• Conditional &amp; repeat statements</li><li>• Representation of an Array</li><li>• Sparse Matrix</li></ul>		
<b>Unit-2</b>	<b>Stack and Queue</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Stack – Introduction , Operations of stack , Implementation of stack, Applications, Implementation of stack (Using array &amp; linklist)</li><li>• Conversion of stack – Infix to Postfix using manually, and stack for parenthesis and Non-parenthesis</li><li>• Queue – Introduction ,Types of queue, Implementation of Queue (Using Array &amp; Link list)</li><li>• Operations of simple and circular Queue.</li></ul>		
<b>Unit-3</b>	<b>Sorting and searching Techniques</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Bubble sort, Selection sort</li><li>• Quick Sort, Merge Sort</li><li>• Insertion Sort, Shell Sort</li><li>• Linear Search, Binary Search</li></ul>		
<b>Unit-4</b>	<b>Linked List</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Comparison of array &amp; Link List</li><li>• Types of Link list , Representation of linked list</li><li>• Operations on Single and Doubly Linked Lists</li><li>• Operations on Circular Linked Lists</li></ul>		
<b>Unit-5</b>	<b>Tree and Graph</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Introduction on Tree ,Types of tree , binary trees.</li><li>• operations on tree (Create and delete)</li><li>• Tree traversal method and algorithm ( recursive only)</li><li>• Introduction to Graph, Types of graph, Graph definations</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. Data Structures and Program design in C - R. Kruse C.L. Tondo and B. Leung - PHI, 1997.</li><li>2. Data &amp; File Structure: Tremblay &amp; Sorenson</li><li>3. Expert in Data Structure with C: R. B. Patel (Second or above editions)</li></ol>			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT      Course: Programming in C++      Course No: B.Sc IT-CC-304</b>			
Semester: <b>03</b>		Type of Course : Core Course	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100			
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Fundamental of Programming</b>	<b>9</b>	<b>14</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></ul>		
<b>Unit-2</b>	<b>OOP Concept</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Function – Member function, Inline function, Friend function</li><li>• Constructor – Types of constructor, characteristics of constructor, constructor overloading.</li><li>• Destructor</li><li>• Input/output statements</li><li>• Declaration &amp; Creation of Class and Object</li></ul>		
<b>Unit-3</b>	<b>Operator overloading and Type conversion</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Basic of operator overloading</li><li>• Types of operator overloading-Unary, Binary</li><li>• Operator overloading using member function &amp; friend function</li><li>• Type conversion</li><li>• Categories of type conversion</li></ul>		
<b>Unit-4</b>	<b>Inheritance &amp; Polymorphism</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Inheritance</li><li>• Types of inheritance</li><li>• *this pointer</li><li>• Polymorphism (Compile time and Run time polymorphism)</li><li>• Pure virtual function</li></ul>		
<b>Unit-5</b>	<b>File Handling and exception handling</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"><li>• Concepts Stream class and its function</li><li>• File stream class structure and operation</li><li>• Sequential and random access file</li><li>• Command line arguments</li><li>• Exception handling</li></ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"><li>1. E-Balaguruswami: Object Oriented Programming with C++ Mc Graw-Hill</li><li>2. Robert Lafore: Object Oriented Programming with C++ Galgotia Publications.</li><li>3. Rajaraman: Object Oriented Programming with C++ New age International</li></ol>			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b> Semester: <b>03</b>		<b>Course: System Analysis And Design</b> Type of Course : Core Course	<b>Course No: B.Sc IT-CC-305</b>	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
<b>Unit-1</b>	<b>System Concepts</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Introduction to System, Characteristics &amp; Elements of system.</li> <li>• Major System concepts and Types of System.</li> <li>• System Analysis, Role of System Analyst.</li> <li>• Information &amp; Information System, CBIS.</li> <li>• System users.</li> </ul>			
<b>Unit-2</b>	<b>System Development Life Cycle (SDLC)</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Requirement analysis and Determination.</li> <li>• System Design Technique.</li> <li>• System Development.</li> <li>• System Testing.</li> <li>• System Implementation and Evaluation.</li> </ul>			
<b>Unit-3</b>	<b>Structured System Analysis and Design Method</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Introduction to SSADM.</li> <li>• Need of Structured Analysis and Design.</li> <li>• System survey.</li> <li>• Structured analysis.</li> <li>• Structured design.</li> <li>• Advantage of SSADM.</li> </ul>			
<b>Unit-4</b>	<b>Input / Output Design, Fact Gathering Techniques and implementation</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Input - Data capture objectives, Data verification and validation.</li> <li>• Interactive screen design.</li> <li>• Output - Design principles of output, Output objectives and types.</li> <li>• Fact Gathering Techniques-Interviewing, Questionnaires, Record inspection, Observations.</li> <li>• Implementation Method - parallel systems, direct conversation, pilot system, phase-in.</li> </ul>			
<b>Unit-5</b>	<b>Analysis and Design Tools</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• DFD: Logical and Physical DFD.</li> <li>• Decision tables.</li> <li>• Decision Tree.</li> <li>• Data Dictionary.</li> <li>• HIPO chart and Structured English.</li> <li>• Case Study</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. 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>				



<b>B.Sc. IT</b>		<b>Course: Operating System - I</b>	<b>Course No: B.Sc IT-CC-306</b>	
Semester: <b>03</b>		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
<b>Unit</b>	<b>Detailed Syllabus</b>	<b>Teaching Hours</b>	<b>Marks/Weight</b>	
<b>Unit-1</b>	<b>Basic of Operating System.</b>	<b>9</b>	<b>14</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>• Operating System Component – Services, System calls and system programs</li> </ul>			
<b>Unit-2</b>	<b>Operating System Types &amp; Structure.</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Operating system types-Desktop System, Real time systems, Multiprocessor System, parallel, distributed system, cluster system</li> <li>• Operating system structure-monolithic layered, virtual machine &amp; Client server.</li> </ul>			
<b>Unit-3</b>	<b>Process Scheduling</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Process states, Queuing diagram, Interrupt mechanism.</li> <li>• Schedulers and Dispatcher</li> <li>• Scheduling algorithms (FIFO, SJF, Priority, RR) with Performance evaluation</li> </ul>			
<b>Unit-4</b>	<b>Threads &amp; Deadlocks</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Threads - Concept of single &amp; multithreads, Benefits of threads – Types of threads.</li> <li>• Deadlock: safe and unsafe state, Necessary conditions to occur deadlock, Deadlock Prevention, avoidance, detection, and recovery</li> </ul>			
<b>Unit-5</b>	<b>Memory Management</b>	<b>9</b>	<b>14</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> </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> </ol>				





**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b> <span style="float: right;"><b>Course: Practical</b></span> <span style="float: right;"><b>Course No: B.Sc IT-CC-307</b></span>			
<b>Semester: 03 Type of Course: Core Course</b>			
<b>Marking Scheme: External Examination: 100 + Internal Examination: 00 = 100 Marks</b>			
<b>Credits: 12 Practical Sessions per Week: 12</b>		<b>Teaching</b>	
<b>Hours:180Hours</b>			
<b>Unit</b>	<b>Detailed Syllabus</b>	<b>Teaching Hours</b>	<b>Marks/Weight</b>
Unit-1	Practical Based on 303	<b>90</b>	<b>50</b>
Unit-2	Practical Based on 304	<b>90</b>	<b>50</b>



**BACHELOR OF SCIENCE - INFORMATION TECHNOLOGY (B.Sc.(IT))**

**Semester-IV (SY)**

<b>Course No.</b>	<b>Course Type</b>	<b>Subject</b>	<b>Credit</b>
B.Sc.(IT)-EC-401	ELECTIVE	NANOMATERIALS & NANOTECHNOLOGY	02
B.Sc.(IT)-FC-402	FOUNDATION	ENGLISH	02
B.Sc.(IT)-CC-403	CORE	WINDOW PROGRAMMING USING VB.NET	03
B.Sc.(IT)-CC-404	CORE	DATABASE CONCEPT AND TOOLS	03
B.Sc.(IT)-CC-405	CORE	COMPUTER NETWORK	03
B.Sc.(IT)-CC-406	CORE	OPERATING SYSTEM-II	03
B.Sc.(IT)-CC-407	CORE	PRACTICAL (BASED ON 403 AND 404)	12
Total			28

**Internal Continuous Evaluation:**

1. There will be Internal Continuous Evaluation in Theory papers of Core Course.
2. There will be 30 marks for Assignments in Course No: B.Sc.(IT)-CC-403, B.Sc.(IT)-CC-404, B.Sc.(IT)-CC-405, B.Sc.(IT)-CC-406



B.Sc. (IT) (EC)  
Semester: IV

Paper EC: 401: Nanomaterials and Nanotechnology

Credits: 02

Marks : 100

Examination: Internal evaluation

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.	09	20
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.	09	20
3	<b>Characterization Techniques for Nanomaterials-1:</b> Paricle size Analyser (Laser seattering), Optical Microscopy, Seanning Electron Mieroscopy (SEM), Transmission Electron Microscopy (TEM), Scanning Tunnel Microscopy (STM).	09	20
4	<b>Characterization Techniques for Nanomaterials-2:</b> Paricle size Analyser (Laser seattering), Optical Microscopy, Seanning Electron Mieroscopy (SEM), Transmission Electron Microscopy (TEM), Scanning Tunnel Microscopy (STM).X-ray Diffraction (XRD), Auger Emission Spectroscopy, Electron Spectroscopy for Chemical analysis (ESCA)	09	20
5	<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.	09	20

Marks: Semester End Internal Examination: 100 Marks

**:: 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



**B.Sc. (IT)  
SEMESTER – IV**

**FOUNDATION COURSE:**

**FC-402: English**

**Credit: 03**

Unit: 1

14 Marks

- (a) The Happy Prince : Oscar Wilde
- (b) The Gift of Magi : O Henry
- (c) The Ant and the Grasshoper: Somerset Maugham

Unit 2

14 Marks

- (a) Communication Skills: Reading, writing, speaking, listening
- (b) Communication Skills: Reading, writing, speaking, listening

Unit 3

14 Marks

- (a) basics of letter writing theory: Form, structure, layout, appearance etc
- (b) basics of letter writing theory: Form, structure, layout, appearance etc

Unit 4

14 Marks

- (a) Official letters : complaints and suggestions
- (b) Leave Applications

Unit 5

14 Marks

- (a) Confusing pair of words
- (b) Essay Writing

**Texts and references:**

1. Six Short Stories: Board of Editors OUP Third Impression 2002
2. Sinha, K.K. Business Communication. Galgotia Publishing Company, New Delhi.
3. Advanced English Grammar – by Martin Hewings. Cambridge Uni. Press. 1999.
4. Green, David. Contemporary English Grammar Structures and Composition. Macmillan.
5. Amazing English Anish George Issac's Publication
6. Business English Rai and Rai Himalaya Publication



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>			
<b>Course: Window Programming Using VB.NET</b> <b>Course No: B.Sc IT-CC-403</b>			
Semester: <b>04</b>		Type of Course : Core Course	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100			
Credits: 03		Teaching Hours: 45 Hours	
		Theory Sessions per Week: 03	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction</b>	<b>9</b>	<b>14</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> <li>• Console Application</li> </ul>		
<b>Unit-2</b>	<b>Basic Controls</b>	<b>9</b>	<b>14</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> </ul>		
<b>Unit-3</b>	<b>Advance Control</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <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> <li>• Built In Dialog box (Open File Dialog, Save File Dialog, Color Dialog, Font Dialog, Folder Browser Dialog)</li> </ul>		
<b>Unit-4</b>	<b>Database Connectivity</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <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-5</b>	<b>Object Oriented Programming</b>	<b>9</b>	<b>14</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, ReadWrite Properties</li> <li>• Constructor &amp; Destructor.</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**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>		<b>Course: Database Concept &amp; Tools</b>		<b>Course No: B.Sc IT-CC-404</b>	
Semester: <b>04</b>		Type of Course : Core Course			
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100					
Credits: 03		Theory Sessions per Week: 03		Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight		
<b>UNIT-1</b>	<b>DBMS AND RDBMS CONCEPTS</b>	<b>9</b>	<b>14</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>• Object relational model</li> </ul>				
<b>UNIT-2</b>	<b>INTRODUCTION TO ORACLE SERVER</b>	<b>9</b>	<b>14</b>		
	<ul style="list-style-type: none"> <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> <li>• Dr. E.F.Codd's Rules</li> </ul>				
<b>UNIT-3</b>	<b>BASIC SQL*PLUS</b>	<b>9</b>	<b>14</b>		
	<ul style="list-style-type: none"> <li>• Basic Data Types of ORACLE</li> <li>• Data Definition Language (DDL)</li> <li>• Data Manipulation Language (DML)</li> <li>• Transaction Processing Language (TPL)</li> <li>• Data Constraints AND Types of Data Constraints</li> <li>• Inbuilt Functions and Oracle Operators.</li> </ul>				
<b>UNIT-4</b>	<b>ADVANCE SQL*PLUS</b>	<b>9</b>	<b>14</b>		
	<ul style="list-style-type: none"> <li>• Grouping of Data</li> <li>• Sub queries and Types of Sub queries</li> <li>• Join and types of join</li> <li>• Schema and Schema object: View, Sequence, index, synonyms.</li> </ul>				
<b>UNIT-5</b>	<b>INTRODUCTION TO DBA</b>	<b>9</b>	<b>14</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> </ul>				
<b>Reference Books</b>					
<ol style="list-style-type: none"> <li>1. Ivan Bayross: SQL/PLSQL, The Programming Language of ORACLE, BPB Publication</li> <li>2. Learn Oracle 8i. By Jose A. Ramalho. Published by: BPB</li> <li>3. SQL in 21-Days - Techmedia</li> </ol>					



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>		<b>Course: Computer Network</b>	<b>Course No: B.Sc IT-CC-405</b>	
Semester: <b>04</b>		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
<b>Unit-1</b>	<b>Introduction &amp; Transmission Media</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Communication System</li><li>• Analog &amp; Digital Data</li><li>• Communication Channel</li><li>• Twin Wire and Co-axial cable, Fiber Optic</li><li>• Radio Waves &amp; Microwaves</li></ul>			
<b>Unit-2</b>	<b>Optical Fiber Communication &amp; Satellite Communication</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Optical Source &amp; Light Detectors</li><li>• Propagation in Fiber</li><li>• Basic of Routing</li><li>• FDDI &amp; DQDB</li><li>• Satellite Link and Satellite Communication</li></ul>			
<b>Unit-3</b>	<b>Data Networks &amp; Data Communication System</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Circuit Switching &amp; Packet Switching</li><li>• PABX</li><li>• Facsimile (Fax)</li><li>• Introduction to ISDN</li><li>• Multiplexing – FDM, TDM &amp; WDM</li></ul>			
<b>Unit-4</b>	<b>Network Topology, Architecture &amp; Standards</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• LAN,WAN, MAN</li><li>• Basic Network Topologies</li><li>• Ethernet, Token Bus &amp; Token Ring</li><li>• IEEE Standards 802 For LAN and MAN</li><li>• Introduction to Bluetooth</li></ul>			
<b>Unit-5</b>	<b>Network Protocol and Firewall</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• ATM &amp; X.25 Protocol</li><li>• Inter-W</li><li>• Bridges, Routers And Brouters, Gateways</li><li>• Repeaters, Modems, Hubs and Switches</li><li>• Firewall</li></ul>			
<b>Reference Books</b>				
<ol style="list-style-type: none"><li>1. Andrews Tananbaum: Computers Networks, PHI</li><li>2. Michel and Miller: Introduction to Digital Data Communication</li><li>3. James Martin: Telecommunication and Compute</li></ol>				



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>		<b>Course: Operating System - II</b>	<b>Course No: B.Sc IT-CC-406</b>	
Semester: <b>04</b>		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03		Teaching Hours: 45 Hours
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
<b>Unit-1</b>	<b>File &amp; I/O Management</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• File Concept, Characteristics of file, File operations, File system structure</li><li>• Access Methods - Sequential , direct and Index sequential</li><li>• Directory Structure - single level, two level, tree level, Directory operations.</li><li>• Overview of I/O System, Application of I/O Interface, I/O hardware and subsystem.</li><li>• Disk scheduling algorithm (FIFO, SSTF, SCAN, CSCAN)</li></ul>			
<b>Unit-2</b>	<b>Distributed Operating system</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Introduction and need for distributed OS</li><li>• Architecture of Distributed OS</li><li>• Models of distributed system</li><li>• Remote procedure Calls</li><li>• Distributed shared memory</li></ul>			
<b>Unit-3</b>	<b>Introduction to Linux Operating System</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Introduction to Linux Operating System</li><li>• History, Advantage &amp; Disadvantage of Linux Operating System.</li><li>• Application area of Linux Operating System.</li><li>• Linux Flavors</li><li>• Desktop Environment – Xwindow, KDE &amp; GNOME.</li></ul>			
<b>Unit-4</b>	<b>File Structure &amp; Commands</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• File system hierarchy standard.</li><li>• Linux architecture</li><li>• Shell &amp; its types.</li><li>• File &amp; directory Command</li><li>• Process command</li><li>• User command</li><li>• Misc. Command</li></ul>			
<b>Unit-5</b>	<b>Shell Script</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Introduction to Vi Editor</li><li>• Mode of Vi Editor</li><li>• Shell Variable, Shell Operator</li><li>• Structure Language – Control structure, Iterating Statement and Array</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><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>				





<b>B.Sc IT</b> <b>Course: Practical</b> <b>Course No: B.Sc IT-CC-407</b>			
<b>Semester: 03 Type of Course: Core Course</b>			
<b>Marking Scheme: External Examination: 100 + Internal Examination: 00 = 100 Marks</b>			
<b>Credits: 12 Practical Sessions per Week: 12</b>			<b>Teaching</b>
<b>Hours:180Hours</b>			
<b>Unit</b>	<b>Detailed Syllabus</b>	<b>Teaching Hours</b>	<b>Marks/Weight</b>
Unit-1	Practical Based on 403	90	50
Unit-2	Practical Based on 404	90	50



Academic Council: 30-05-2017, R.No. (02)

**CHOICE BASED CREDIT SYSTEM**  
Credit and Semester System Syllabus

**BACHELOR OF SCIENCE - INFORMATION TECHNOLOGY (B.Sc.(IT))**

**Semester-V (TY)**

Course No.	Course Type	Subject	Credit
B.Sc.(IT)-EC-501	ELECTIVE		02
B.Sc.(IT)-FC-502	FOUNDATION		02
B.Sc.(IT)-CC-503	CORE	WEB PROGRAMMING-I Using PHP	03
B.Sc.(IT)-CC-504	CORE	ADVANCE DATABASE CONCEPT AND TOOLS	03
B.Sc.(IT)-CC-505	CORE	SOFTWARE ENGINEERING	03
B.Sc.(IT)-CC-506	CORE	MANAGEMENT INFORMATION SYSTEM	03
B.Sc.(IT)-CC-507	CORE	PRACTICAL (BASED ON 503 AND 504)	12
Total			28

Internal Continuous Evaluation:

1. There will be Internal Continuous Evaluation in Theory papers of Core Course.
2. There will be 30 marks for Assignments in Course No: B.Sc.(IT)-CC-503, B.Sc.(IT)-CC-504, B.Sc.(IT)-CC-505, B.Sc.(IT)-CC-506



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>		<b>Course: Web Programming – I Using PHP</b>	<b>Course No: B.Sc IT-CC-503</b>	
Semester: <b>05</b>		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03		Teaching Hours: 45 Hours
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
<b>Unit-1</b>	Introduction	<b>9</b>	<b>14</b>	
	Fundamental of APACHE Server. Concept of Wamp & Xampp Server. History & Versions of PHP Features of PHP Introduction to PHP Programming.			
<b>Unit-2</b>	Introduction to Java Script	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Variable and Data Type Types of Operators Conditional Statements, looping Statements</li> <li>• Array, Functions ,Events ,Message Box ,Objects Based Programming</li> <li>• Validation of form using JavaScript ,Different types of effects in designing using JavaScript</li> </ul>			
<b>Unit-3</b>	Basic PHP	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Introduction to PHP, PHP Variables</li> <li>• Operators in PHP</li> <li>• Conditional Statements &amp; looping Statements in PHP</li> <li>• Array , Types of Array</li> <li>• Functions – UDF and Built in Functions.</li> </ul>			
<b>Unit-4</b>	Form Handling	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Handling form with GET &amp; POST, Cookies, Session, Server variable</li> <li>• Regular Expressions in PHP, Functions used in Regular Expressions, Symbols used in Regular Expressions</li> <li>• Exception Handling</li> <li>• Object Oriented concept in PHP</li> </ul>			
<b>Unit-5</b>	<b>Interaction between PHP &amp; MySQL</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• PHP-MySQL Architecture</li> <li>• PHP API</li> <li>• Creating &amp; Connecting Database using Wamp Server</li> <li>• Executing DML Commands.</li> </ul>			
<b>Reference Books</b>				
1. Ivan Bayross, Sharanam Shah: PHP 5.1 For Beginners, Shroff Publishers & Distributors (SPD) 2. Janet Valade: PHP5 & MYSQL Projects, Wiley Dreamtech 3. Dave W. Mercer: Beginning PHP5, Wiley India Edition 4. Steven Holzner: The Complete Reference PHP, Tata McGRAW – HiLL, New Delhi				



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>			
<b>Course: Advance Database Concept &amp; Tools</b>		<b>Course No: B.Sc IT-CC-504</b>	
Semester: <b>05</b>		Type of Course : Core Course	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100			
Credits: 03		Teaching Hours: 45 Hours	
		Theory Sessions per Week: 03	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>PL/SQL-I</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <li>• Introduction of PL / SQL Blocks, PL/SQL Engine, PL/SQL Programming</li> <li>• How PL / SQL work, Control structure of PL/SQL.</li> <li>• Cursor: Introduction of Cursor, types of Cursor, Declaring Cursor, Attributes of Cursor, Accessing cursor, Closing Cursor.</li> <li>• Exception Handling: Introduction of Exception Handling, Predefine Exception, Undefine Exception, User Define Exception.</li> </ul>		
<b>Unit-2</b>	<b>PL/SQL-II</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <li>• Stored Procedure: Creating and Executing Stored Procedure</li> <li>• Function: Creating and Executing Function</li> <li>• Trigger: Components of trigger, types of trigger, creating a trigger.</li> <li>• Locking: Implicit and explicit locking</li> </ul>		
<b>Unit-3</b>	<b>Oracle utility</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <li>• Database Backup (Hot and Cold Backup) and Recovery</li> <li>• Types of Failure</li> <li>• Data structure used for Database recovery</li> <li>• Import and export</li> <li>• SQL LOADER Utility</li> </ul>		
<b>Unit-4</b>	<b>Advance Database Concept</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <li>• Data Models: Post-Relational Data Model, object oriented Data Model, Dimensional Data Model</li> <li>• OODM and previous Data models – similarities and differences</li> <li>• Features for Object Oriented system</li> <li>• OODBMS – pros and cons</li> </ul>		
<b>Unit-5</b>	<b>Database Security</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <li>• Introductory terms – privacy, database security, database integrity.</li> <li>• authorization</li> <li>• Security and Integrity threats – Accidental and Intentional</li> <li>• Security policies – Access control, Information flow</li> <li>• Access types</li> <li>• Identification and Authentication</li> </ul>		
<b>Reference Books</b>			
<ol style="list-style-type: none"> <li>1. Ivan Bayross: SQL/PLSQL, The Programming Language of ORACLE, BPB Publication</li> <li>2. Learn Oracle 8i. By Jose A. Ramalho. Published by: BPB</li> <li>3. SQL in 21-Days – Techmedia</li> <li>4. Bipin C. Desai – An Introduction to Database Systems</li> <li>5. Avi Silberschatz, Henry F. Korth, S. Sudarshan – Database System Concepts, McGraw-Hill</li> <li>6. Raghu Ramakrishnan, Johannes Gehrke – Database Management System, Tata McGraw Hill</li> </ol>			



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>		<b>Course: Software Engineering</b>	<b>Course No: B.Sc IT-CC-505</b>	
Semester: <b>05</b>		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
<b>Unit-1</b>	<b>Introduction</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Introduction to Software Engineering &amp; Approaches of Software Engineer</li> <li>• Software(S/W) &amp; Nature of S/W</li> <li>• Software Development Process Models – Water Fall Model, Prototyping, Iterative Enhancement, Spiral Model</li> </ul>			
<b>Unit-2</b>	<b>Software Requirements Analysis &amp; Specifications</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Software Requirements – Need For SRS, Requirement Process</li> <li>• Role of SRS</li> <li>• Problem Analysis – Informal Approach, Structured Analysis, Object Oriented Modeling</li> <li>• Requirement Specifications</li> <li>• Validation &amp; Verification</li> </ul>			
<b>Unit-3</b>	<b>Planning &amp; Design of Software.</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Team Structure, Quality assurance plan</li> <li>• Risk Management, System Design principles, Module level concepts, Coupling &amp; Cohesion</li> <li>• Design Methodology, Structure Chart</li> <li>• Functional approach vs. Object oriented approach.</li> </ul>			
<b>Unit-4</b>	<b>Coding &amp; Testing</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Programming Practice, Testing Fundamentals</li> <li>• Top Down &amp; Bottom Up Approach for Coding &amp; Testing</li> <li>• Testing Fundamentals – Error, Fault, Failure</li> <li>• Levels of Testing</li> <li>• Test cases &amp; Test criteria</li> <li>• Types of testing – Black Box, White Box &amp; Grey Box</li> </ul>			
<b>Unit-5</b>	<b>Case Study</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Case study               <ol style="list-style-type: none"> <li>1. Student Management System</li> <li>2. Hotel Management System</li> <li>3. Airline Reservation System</li> <li>4. Inventory Management System</li> <li>5. Payroll Management System.</li> </ol> </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. Roger Pressman: Software Engineering, McGraw-Hill Publication</li> </ol>				



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>		<b>Course: Management Information System</b>	<b>Course No: B.Sc IT-CC-506</b>	
Semester: <b>05</b>		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
<b>Unit-1</b>	<b>Introduction to Management Information Systems</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• MIS Concepts –EIS, DSS, MRS, TPS and OIS</li> <li>• Concept of Organization, Management and Information</li> <li>• Information – Meaning, Uses and Cost of Information</li> <li>• The need for Information system</li> </ul>			
<b>Unit-2</b>	<b>The Structure of MIS</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Types of organizational Information: TPS, MRS, DSS, EIS, OIS</li> <li>• Characteristics of MRS</li> <li>• Reports by MRS – Report’s forms: Scheduled(Periodic) Report, Exception Report, Demand Report</li> <li>• Characteristics of DSS</li> <li>• Characteristics of EIS.</li> </ul>			
<b>Unit-3</b>	<b>Information needs for strategic planning</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Concept of value streams and strategy</li> <li>• Characteristics of information – cost, accessibility, reliability, security</li> <li>• Strategies for competitive advantages – differentiation, cost leadership, focus.</li> <li>• Information usage for strategic advantage</li> <li>• International strategy</li> </ul>			
<b>Unit-4</b>	<b>Introduction of Enterprise Resource Planning (ERP)</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Concept of Enterprise Management System (EMS) and ERP</li> <li>• ERP Architecture and EMS model</li> <li>• ERP Basic Features</li> <li>• Characteristics of ERP solutions and benefits of ERP</li> <li>• ERP solution evaluation</li> </ul>			
<b>Unit-5</b>	<b>Development of MIS plan and Quality and Privacy issues</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Contents of MIS plan</li> <li>• MIS plan is linked to the business plan</li> <li>• Classification of information – organizational, functional, knowledge, decision support and operational</li> <li>• Management of Quality in MIS</li> </ul>			
<b>Reference Books</b>				
<ol style="list-style-type: none"> <li>1. Management Information System By K.C. Laudon. and J.P. Laudon. PHI</li> <li>2. Management Information System By V.S.Bagad</li> <li>3. Management Information System By Sadagopan</li> </ol>				



<b>B.Sc IT</b> <b>Course: Practical</b> <b>Course No: B.Sc IT-CC-507</b>			
<b>Semester: 05 Type of Course: Core Course</b>			
<b>Marking Scheme: External Examination: 100 + Internal Examination: 00 = 100 Marks</b>			
<b>Credits: 12 Practical Sessions per Week: 12</b>			<b>Teaching</b>
<b>Hours:180Hours</b>			
<b>Unit</b>	<b>Detailed Syllabus</b>	<b>Teaching Hours</b>	<b>Marks/Weight</b>
Unit-1	Practical Based on 503	90	50
Unit-2	Practical Based on 504	90	50



**BACHELOR OF SCIENCE - INFORMATION TECHNOLOGY (B.Sc.(IT))**

**Semester-VI (TY)**

Course No.	Course Type	Subject	Credit
B.Sc.(IT)-EC-601	ELECTIVE		02
B.Sc.(IT)-FC-602	FOUNDATION		02
B.Sc.(IT)-CC-603	CORE	WEB PROGRAMMING-II Using ASP.NET	03
B.Sc.(IT)-CC-604	CORE	OOP USING JAVA	03
B.Sc.(IT)-CC-605	CORE	DATA WARE HOUSE AND DATA MINING	03
B.Sc.(IT)-CC-606	CORE	MINI PROJECT	03
B.Sc.(IT)-CC-607	CORE	PRACTICAL (BASED ON 603 AND 604)	12
<b>Total</b>			<b>28</b>

Internal Continuous Evaluation:

1. There will be Internal Continuous Evaluation in Theory papers of Core Course.
2. There will be 30 marks for Assignments in Course No: B.Sc.(IT)-CC-603, B.Sc.(IT)-CC-604, B.Sc.(IT)-CC-605, B.Sc.(IT)-CC-606





<b>B.Sc IT</b>			
<b>Course: Web Programming – II Using ASP.NET</b>		<b>Course No: B.Sc IT-CC-603</b>	
Semester: <b>06</b>		Type of Course : Core Course	
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100			
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight
<b>Unit-1</b>	<b>Introduction</b>	<b>9</b>	<b>14</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> </ul>		
<b>Unit-2</b>	<b>Basic Controls</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <li>• Label, Button and Textbox.</li> <li>• List Controls: Dropdownlist, listbox, checkbox list, radiobutton list, BulletedList.</li> <li>• Radio button, checkbox.</li> <li>• File upload and Image control.</li> <li>• Hyperlink, table, panel and wizard</li> </ul>		
<b>Unit-3</b>	<b>Advance controls</b>	<b>9</b>	<b>14</b>
	<ul style="list-style-type: none"> <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-4</b>	<b>Working with Database</b>	<b>9</b>	<b>14</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-5</b>	<b>AJAX &amp; Web services</b>	<b>9</b>	<b>14</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> <li>3. Asp.net Professional Edition by Wrox Publication</li> </ol>			



<b>B.Sc IT</b>		<b>Course: OOP Using JAVA</b>	<b>Course No: B.Sc IT-CC-604</b>	
Semester: <b>06</b>		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03		Teaching Hours: 45 Hours
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
<b>Unit-1</b>	<b>Basic of JAVA</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Basic concept of OOP Approach-Class and object, Abstraction and Encapsulation, Inheritance and Polymorphism.</li><li>• Overview of Netbeans and eclipse editor.</li><li>• Java Language Basics- Byte code, Buzz Words, JVM</li><li>• Data types, Operators, Control &amp; Looping Statement, Array, and command line argument</li></ul>			
<b>Unit-2</b>	<b>Object - Oriented Programming Technique</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Class and Objects, Methods</li><li>• Constructor, Garbage Collection</li><li>• Inheritance</li><li>• Polymorphism</li></ul>			
<b>Unit-3</b>	<b>Package, Interface and Exception Handling</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Packages</li><li>• Interfaces</li><li>• Exception Handling</li></ul>			
<b>Unit-4</b>	<b>Multithreading</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Introduction, Main Thread , Thread Lifecycle</li><li>• Thread Creation, isAlive(), join() methods</li><li>• Thread Priority</li><li>• Synchronization</li></ul>			
<b>Unit-5</b>	<b>I/O In JAVA, String &amp; Characters Methods</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"><li>• Introduction to I/O.</li><li>• Stream Classes - ByteStream &amp; CharacterStream.</li><li>• Reading and Writing into file , Reading and writing from Console.</li><li>• String Class-operation, methods.</li><li>• Serialization.</li></ul>			
<b>Reference Books</b>				
<ol style="list-style-type: none"><li>1. Compete Reference Java By Herbert Schildt Publisher: TMH</li><li>2. Programming in JAVA By E-Balaguruswami</li></ol>				



**MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY**  
**NAAC Accreditation Grade "B"**  
**(With effect from Academic Year: 2017-18)**

<b>B.Sc IT</b>		<b>Course: Data Warehouse &amp; Data Mining</b>	<b>Course No: B.Sc IT-CC-605</b>	
Semester: <b>06</b>		Type of Course : Core Course		
Marking Scheme: External Examination: 70 + Internal Examination: 30 = 100				
Credits: 03		Theory Sessions per Week: 03	Teaching Hours: 45 Hours	
Unit	Detailed Syllabus	Teaching Hours	Marks/Weight	
UNIT-1	<b>INTRODUCTION OF DATAWAREHOUSE AND DATA MART</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Operational and Informational systems.</li> <li>• Concept of Data warehouse ,Characteristics of Data Warehouse</li> <li>• DBMS vs. data warehouse</li> <li>• Data warehouse system architecture ( Two and Three-Tiered)</li> <li>• Concept of Data Mart , Usage of Data Mart</li> <li>• Security in Data Mart</li> <li>• Data warehouse and Data Mart</li> </ul>			
UNIT-2	<b>ONLINE ANALYTICAL PROCESSING</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• OLTP AND OLAP SYSTEM</li> <li>• OLTP VS OLAP</li> <li>• TYPES OF OLAP: ROLAP, MOLAP,HOLAP</li> <li>• Comparison of ROLAP,MOLAP,HOLAP</li> </ul>			
UNIT-3	<b>ETL and Data Mining</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Concept of ETL(Extract,Transformation and Loading of Data )</li> <li>• Comparison and contradiction of various ETL tools</li> <li>• Data Mining-Definition and Functionalities</li> <li>• Classification of DM Systems</li> <li>• DM task primitives</li> <li>• Integration of a Data Mining system with a Database or a Data Warehouse</li> <li>• Issues in DM</li> <li>• KDD Process</li> </ul>			
UNIT-4	<b>Data Mining Techniques</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Data Mining techniques</li> <li>• Data Processing (Data Cleaning, Integration and Transformation, Reduction)</li> <li>• Data mining Primitives and DMQL</li> <li>• Designing GUI based on a DMQL</li> <li>• Architecture of Data Mining System</li> </ul>			
UNIT-5	<b>Advance Data Mining</b>	<b>9</b>	<b>14</b>	
	<ul style="list-style-type: none"> <li>• Mining Text Data</li> <li>• Mining Spatial Databases</li> <li>• Mining WWW</li> <li>• Mining sequence Data: Time-Series, Symbolic Sequences, and Biological Sequences</li> <li>• Mining graphs and Network</li> <li>• Data Mining application and trends</li> </ul>			
<b>Reference Books</b>				
<ol style="list-style-type: none"> <li>1. Data Mining – Concepts &amp; Techniques; Jiawei Han &amp; Micheline Kamber – First Indian Reprint 2002, Morgan Kaufmann publication.</li> <li>2. Data Warehousing in the Real World; Sam Anahory &amp; Dennis Murray; 1997, Pearson</li> <li>3. Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderabad.</li> <li>4. Data Mining; Pieter Adriaans &amp; Dolf Zantinge; 1997, Pearson</li> </ol>				



6. Data Warehousing, Data Mining and OLTP; Alex Berson, 1997, McGraw Hill.
7. Data warehousing System; Mallach; 2000, McGraw

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



<b>B.Sc IT</b>				<b>Course: Practical</b>				<b>Course No: B.Sc IT-CC-607</b>			
<b>Semester: 06 Type of Course: Core Course</b>											
<b>Marking Scheme: External Examination: 100 + Internal Examination: 00 = 100 Marks</b>											
<b>Credits: 12</b>				<b>Practical Sessions per Week: 12</b>				<b>Teaching Hours: 180 Hours</b>			
Unit	Detailed Syllabus							Teaching Hours	Marks/Weight		
Unit-1	Practical Based on 603							90	50		
Unit-2	Practical Based on 604							90	50		