

BHAKTA KAVI NARSINH MEHTA UNIVERSITY

JUNAGADH– INDIA



CURRICULAM

FOR

B.Sc. (I.T.)

Bachelor of Science (Information Technology)

(Semester - 1 and Semester - 2)

Effective From June – 2016

(Semester III and Semester IV)

Effective From June – 2017

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016
Bachelor of Science (Information Technology) B.Sc. (I.T.)
[3 years – Six Semester Full Time Program]

Ordinance, Regulations and Examination Scheme:

O. B.Sc. (I.T.) – 1: Candidate for admission to the Bachelor of Science (Information Technology) must have passed standard 12th or equivalent examination from Gujarat higher secondary board or any other board.

O. B.Sc. (I.T.) – 2: Candidate seeking admission directly in third semester of Bachelor of Science (Information Technology) must have passed Examination of Diploma in Engineering in Computer Engineering (CE) / Computer Science (CS) / Information Technology (IT).

O. B.Sc. (I.T.) – 3: The duration of the course will be of three full time academic years. The examination for the Bachelor of Science (Information Technology) course will be divided into six semesters. No candidate will be allowed to join any other course or service simultaneously.

O. B.Sc. (I.T.) – 4: Candidate who have passed an equivalent examination from any other board or examining body and is seeking admission to the B.Sc. (I.T.) course will be required to provide necessary eligibility certificate.

O. B.Sc. (I.T.) – 5: No candidate will be admitted to any semester examination for B.Sc. (I.T.) unless it is certified by the Principal that he has attended the course of study to the satisfaction of the principal of the college.

O. B.Sc. (I.T.) – 6: Candidate desirous of appearing at any semester examination of the B.Sc. (I.T.) course must forward their application in the prescribed form to the University through the principal of the college on or before the date prescribed for the purpose under the relevant ordinances.

O. B.Sc. (I.T.) – 7: No candidate will be permitted to reappear at any semester examination, which he has already passed. The marks of successfully completed paper will be carrying forwarded for the award of class.

O. B.Sc. (I.T.) – 8: There shall be an examination at the end of each semester to be known as first semester examination, second semester examination respectively. At which a student shall appear in that portion of theory papers, practical and viva – voice if any, for which he has kept the semester in accordance with the regulations in this behalf.

A candidate whose term is not granted for what so ever reason shall be required to keep attendance for that semester or term when the relevant papers are actually taken at the college.

O. B.Sc. (I.T.) – 9: After successfully passing all the subjects of semester – 1 candidate will be awarded by certificate CCC and after passing all the subjects of Semester – 1 and Semester – 2 candidate will be awarded by CCC+

O. B.Sc. (I.T.) – 10: Medium of instruction is English.

O. B.Sc. (I.T.) – 11:

Any candidate can go up to take admission in pre to pen-ultimate semester irrespective of failure in any number of subjects.

A Candidate can take admission to pen-ultimate semester if he/she is not failing to more than two subjects.

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

A candidate can take admission to ultimate {final} semester if he/she has cleared all semesters before pen-ultimate semester and not failing in more than two subjects of pen-ultimate semester.

That is a candidate will be permitted to continue his/her study up to the 4th semester examination without passing his/her previous semester examination.

A candidate can take admission to fifth (pen-ultimate) semester if he/she is failing in NOT more than two subjects of previous (1 to 4) semesters.

A candidate can take admission to Sixth (Ultimate Final) Semester if he/she is not failing in more than two subjects of 5th Semester. Provided he/she must have cleared all 1 to 4 semester.

R. B.Sc. (I.T.) – 1 Standard Of Passing

The standard of passing the B.Sc. (I.T.) degree examination will be as under:

- (1) To pass any semester examination of the B.Sc. (I.T.) degree, a candidate must obtain at least 40% marks in the university examination separately in each course of theory and practical.
- (2) Class will be awarded based on Earned Grade Point, SGPA and CGPA as per rules of University.
- (3) A result of candidate who have obtained admission directly in B.Sc. (I.T.) semester – 3 will be declared by considering his marks of semester 3 to 4 in aggregate and accordingly class will be awarded.

R.B.Sc(I.T.) – 2 Marks and credit hours of each course

Marks of Internal examination, university examination and credit hours will be as under:

- (1) Total marks of each theory course are 100 (university examination of 70 marks + internal examination of 30 marks).
- (2) Marks of each unit in the course are equal (i.e. 14 Marks). Total marks of each course are $14 \times 5 = 70$ for university examination.
- (3) Credit hours (lectures) for each unit in the course are equal (i.e. 12 hours). Total credit hours (lectures) of each course are $12 \times 5 = 60$.
- (4) Total marks of each practical and project-viva course are 100. No internal examination of marks in practical and project-viva courses.

R.B.Sc(I.T.) – 3. Structure of Question Paper

Question Paper contains 5 questions (each of 14 marks). Every question will be asked from corresponding unit as specified in the syllabus of each course. (i.e. Question-1 is from Unit No. 1 and remaining questions from their corresponding Units)

Every question is divided in four parts like (a), (b), (c) and (d). Part (a) contains four objective type questions (not MCQ) like definition, reason, answer in one line, answer in one word etc., each of one marks and no internal option. Part (b) contains two questions each of two marks and student will attempt any one out of two. Part (c) contains two questions each of three marks and student will attempt any one out of two. Part (d) contains two questions each of five marks and student will attempt any one out of two.

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

R. B.Sc. (I.T.) – 4 Following is the syllabus of each course of B.Sc.(I.T.) Program.

B.Sc. (I.T.) (Semester – 1)

SR. NO.	COURSE	No. of LECT./Lab. PER WEEK	CREDIT
1.	CS – 01 TECHNICAL COMMUNICATION SKILL	5	5
2.	CS – 02 PROBLEM SOLVING METHODOLOGIS AND PROGRAMMING IN C	5	5
3.	CS – 03 COMPUTER FUNDAMENTALS AND EMERGING TECHNOLOGY	5	5
4.	CS – 04 NETWORKING & INTERNET ENVIRONMENT	5	5
5.	CS – 05 PRACTICALS-1 (BASED ON CS-04 & PC SOFTWARE)	5	5
6.	CS – 06 PRACTICALS-2 (BASED ON CS-2)	5	5
Total Credits of Semester – 1			30

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

CS-01: TECHNICAL COMMUNICATION SKILL		
Objective: To Understand the correct use of English Language and improve the Communication Skills for technical communication		
Unit No.	Topic	Detail
1	Concepts and Fundamentals	Introduction to Technical Communication, meaning of communication, Importance of communication, Communication scope, types, Process of communication, Communication models and theories, Essentials of good communication The seven Cs of communication, Factors responsible for growing importance of communication, Channels of communication, Verbal and Non-Verbal communication, Formal and Informal communication, Barriers of, and aids to communication.[T1, T2, T3, T4]
2	Written Communication	Objectives of written communication, Media of written communication, Merits and demerits of written communication, Planning and preparing of effective business messages. Persuasive writing. Overview of Technical Research and Report Writing : Definition and Nature of Technical Writing, Properties/features and process of Technical Writing, Basic Principles of Technical Writing, Styles in Technical Writing, The Role of Technical Writing, The Wholistic Guide of Technical Writing , End-products of Technical Writing. Writing Proposals. Writing Letters: Business letters, Office memorandum, Good news and bad news letters, Persuasive letters, Sales letters, Letter styles/ layout. Report Writing: Meaning & Definition, Types of report (Business report & Academic report), Format of report, Drafting the report, Layout of the report, Essential requirement of good report writing. Job Application: Types of application, Form & Content of an application, drafting the application, Preparation of resume. [T1,T2,T3,]
3	Oral Communication-1	Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication. Interviews: Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guidelines for interviewee. Meetings: Definition, Kind of meetings, Advantages and disadvantages of meetings/ committees, Planning and

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		organization of meetings. Project Presentations: Advantages & Disadvantages, Executive Summary, Charts, Distribution of time (presentation, questions & answers, summing up), Visual presentation, Guidelines for using visual aids, Electronic media (power-point presentation).
4	Oral Communication-2	Listening Skills: Good listening for improved communications, Art of listening, Meaning, nature, process, types and importance of listening, Principles of good listening, Barriers in listening Negotiation Skills : Definition of negotiation, Factors that can influence negotiation, what skills do we need to negotiate, Negotiation process (preparation, proposals, discussions, bargaining, agreement, implementation). Strategies to, improve oral, presentation, speaking and listening skills. [T1,T2, T3,T4]
5	Soft Skills & Language Skills:	Soft Skills: Non Verbal communication- kinesics & Proxemics, parlanguage, interpersonal skills, Corporate communication skills - Business Etiquettes [T1,T2,T4] Language Skills: Improving command in English, improving vocabulary, choice of words, Common problems with verbs, adjectives, adverbs, pronouns, tenses, conjunctions, punctuations, prefix, suffix, idiomatic use of prepositions. Sentences and paragraph construction, improve spellings, introduction to Business English. [T3, R1, R3]

Seminar - 5 Lectures
Expert Talk - 5 Lectures
Test - 5 Lectures

Total Lectures 60 + 15 = 75

Text Books:

- [T1] Kavita Tyagi and Padma Misra , “Advanced Technical Communication”, PHI, 2011
[T2] P.D.Chaturvedi and Mukesh Chaturvedi, “Business Communication – Concepts, Cases and Applications”, Pearson, second edition.
[T3] Rayudu, “C.S- Communication”, Himalaya Publishing House, 1994.
[T4] Asha Kaul , “Business Communication”, PHI, second edition.

Reference Books:

- [R1] Raymond Murphy, “Essential English Grammar- A self study reference and practice book for elementary students of English” , Cambridge University Press, second edition.
[R2] Manalo, E. & Fermin, V. (2007). Technical and Report Writing. ECC Graphics. Quezon City.
[R3] Kavita Tyagi and Padma Misra , “Basic Technical Communication”, PHI, 2011.
[R4] Herta A Murphy, Herbert W Hildebrandt and Jane P Thomas, “Effective Business

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

Communication”, McGraw Hill, seventh edition.

CS-02: PROBLEM SOLVING METHODOLOGIS AND PROGRAMMING IN C		
Objective: To develop basic programming skill, concept of memory management and file handling.		
Unit No.	Topic	Detail
1	Introduction of C Language	• Introduction of Computer Languages • Introduction of Programming Concept • Introduction of C Language (History & Overview) • Difference between traditional and modern c. • C character set • C tokens ▪ Keywords ▪ Constants ▪ Strings ▪ Identifiers and variables ▪ Operators (all 8 operators) • Hierarchy of operators • Type casting • Data types in c • PRE-PROCESSORS IN C
	Introduction of Logic Development Tools	• Introduction of Logic. • Necessary Instructions for Developing Logic • Basics of Flow Chart • Dry-run and its Use. • Other Logic development techniques
2	Control Structures	• Selective control structure ▪ If statements ▪ Switch statement • Conditional ternary operator • Iterative (looping) control statements ▪ For loop ▪ Do...while loop ▪ While loop • Nesting of loops • Jumping statements ▪ Break statement ▪ Continue statement ▪ Goto statements
3	Library Functions	• Types of library functions ▪ String Function: Strcpy, strncpy, strcat, strncat, strchr, strrchr, strcmp, strncmp, strstr, strcspn, strlen, strpbrk, strstr, strtok

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		▪ Mathematical Functions: Acos, asin, atan, ceil, cos, div, exp, fabs, floor, fmod, log, modf, pow, sin, sqrt ▪ Date & Time Functions: clock, difftime, mktime, time, asctime, ctime, gmtime, localtime, strftime ▪ I/O Formatting Functions: printf, scanf, getc, getchar, gets, putc, putchar, puts, ungetc ▪ Miscellaneous Functions: delay, clrscr, clearer, errno, isalnum, isalpha, iscntrl, isdigit, isgraph, islower, isprint, isspace, isupper, isxdigit, toupper, tolower ▪ Standard Library functions: abs , atof , atol , exit , free, labs , qsort , rand , strtoul , srand ▪ Memory Allocation Functions: malloc , realloc , calloc • Types of user defined functions • Pointers • Function call by value • Function call by reference • Recursion • Storage classes • Passing and returning values
4	Array	• Types of arrays ▪ Single dimensional array ▪ Two dimensional array ▪ Multi-dimensional array ▪ String arrays • Use of Arrays in Programming • Arrays and Matrices
	Structures	• What is structure • Initializations and declarations • Memory allocation functions • Pointers with structures • Array with structures • Udf with structures • Nested structures • Introduction to union • Difference between Structure & Union
5	Pointers	• Introduction of Pointers • Use of pointers in Dynamic Programming • Pointer to Variables • Pointer to Array • Pointer within Array • Pointer To Structure • Pointers within structure • Pointer to Pointer
	File Handling	• Concept of data files

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

	• File handling • Use of file handling functions fopen, fclose, fprintf, fscanf, getw, putw, fseek, ftell, rewind, freopen, remove, rename, feof, ferror, fflush, fgetpos, sprintf, snprintf, vsprintf, vsnprintf, fscanf, vfscanf, setbuf, setvbuf • I/O operations • Command line arguments
--	---

Seminar - 5 Lectures
Expert Talk - 5 Lectures
Test - 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

1. Programming in ANSI C Author : E. Balaguruswami.
2. Let Us C Author : Yashwant Kanetkar.
3. Working with C Author: Yashwant Kanetkar.
4. Programming in C Schaum Series publication.

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

CS-03: COMPUTER FUNDAMENTALS AND EMERGING TECHNOLOGY		
Objective: To aware basics of computer and emerging technology		
Unit No.	Topics	Details
1	Introduction to Computers	• Basics of Computers ○ What is Computer? ○ Characteristics of Computer ○ Data Processing Cycle (Data → Process → information) • Classification of Computer by Data Processed ○ Analog, Digital and Hybrid Computers • History and Generations of Computers ○ First to Fifth Generation Computers • Classification of Computer by Processing Capabilities ○ Micro, Mini, Mainframe and Super Computers • History and Generations of Computers . ○ First to Fifth Generation Computers • Simple Model of Computer ○ Input Devices ○ CPU (Central Processing Unit) ○ Arithmetic & Logic Unit ○ Control Unit ○ Internal Memory • Output Devices • Secondary Storage Devices
	Internal/External parts used with Computer Cabinet	• Introduction to Mother board • Types of Processors . ○ Dual Core, Core 2 Duo, i2, i3, etc • Memory structure and Types of Memory ○ RAM (SRAM, DRAM, SO, DDR, etc.) ○ ROM (ROM, PROM, EPROM, EEPROM, etc.) • Slots ○ ISA Slots / PCI Slots / Memory Slots • Sockets • Cables ○ Serial Cable / Parallel Cable / USB Cable • Ports ○ USB / Serial / Parellel / PS2 • Power Devices :UPS • Graphic Cards

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		• Network card, Sound Card
2	Input Devices	• Introduction • Types of Input Devices ○ Keyboard / Mouse / Trackball / Glide - Pad / Game Devices Joystick, etc.) / Light Pen / Touch Screen / Digitizers and Graphic Tablet / Mic (Sound Input) / Camera (Photo and Video Input) / POS (Point of Sale) Terminal (Scanners, etc) ○ MIDI(Musical Instrument Digital Interface) Keyboard, ○ Wireless Devices (Keyboard, Mouse, etc) • Types of Scanners ○ OCR, OMR, MICR, OBR
	Data Storage	• Introduction • Types of Magnetic Storage Devices ○ Floppy Disk / Hard Disk / Magnetic Tape / Magnetic Disks • Storage Mechanism of Magnetic Storage Devices ○ Tracks / Sectors / Clusters / Cylinders • Reading / Writing Data to and from Storage Devices • Seek Time / Rotational Delay - Latency / Access • Time /Response Time • Other Storage Devices ○ USB - Pen Drive / CD / DVD / Blu-Ray Disk etc. ○ Flash Memory, Cloud Storage(Like Google Drive, OneDrive etc.)
3	Output Devices	• Types of Output Devices • CRT Display Units • Monitor • Non CRT display Units • LCD / LED / Plasma Displays • Types of Printers Impact and Non Impact Printers • Plotters • Other Devices ○ Fascimile(FAX) ○ OLED (Organic LED) ○ Headphone ○ SGD (Speech Generating Device) ○ COM (Computer Output Microfilm) ○ Google Glass

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

4	Numbering System and Codes	• Introduction to Binary Codes / ○ Nibble / Bit / Byte / Carry Bit / Parity Bit / Sign Bit ○ KB / MB / GB / TB / HB (etc) • Types of Numbering System ○ Binary / Octal/Decimal / Hex-Decimal • Conversion ○ Binary to Octal, Decimal and Hexa-Decimal ○ Decimal to Binary, Octal and Hexa-Decimal ○ Octal to Binary, Decimal and Hexa-Decimal ○ Hexa-Decimal to Binary, Octal and Decimal • Binary Arithmetic ○ Addition ○ Subtraction (1's Compliment and 2's Compliment) ○ Division . ○ Multiplication • Types of Codes ○ ASCII/BCD / EBCDIC / UniCode • Parity Check ○ Event Parity System / Odd Parity System
	Languages, Operating Systems and Software Packages	• Introduction • Translator (Assembler / Compiler / Interpreter) • Types of Languages ○ Machine Level Language ○ Assembly Level Language ○ High Level Language (3GL, 4GL, 5GL, etc.) • Types of Operating Systems ○ Batch Operating System ○ Multi Processing Operating System ○ Time Sharing Operating System ○ Online and Real Time Operating System • Uses and applications of Software Packages ○ Word Processing Packages ○ Spread Sheet Packages ○ Graphical Packages ○ Database Packages I ○ Presentation Packages ○ Animation / Video / Sound Packages
5	Emerging Technologies and Virus	• Different Communication methods ○ GIS / GPS / COMA / GSM • Communication Devices I ○ Cell Phones / Modem / Infrared / Bluetooth / WiFi/LiFi/SLM(Spatial Light Modulator) • Virus

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		○ Introduction to Virus and related terms ○ Origin and History ○ Types of Virus ○ Problems and Protection from Virus ● Cloud Computing ○ What is Cloud Computing? ○ Characteristic & Service Models(IaaS, PaaS, SaaS) ○ Architecture ○ Security & Privacy
	Important Terms and Acronyms	● ATM ● Backup / Restore ● Hard Copy / Soft Copy ● Bus / Data Bus ● Buffer and types / Spooling ● Cursor / Pointer / Icon ● E-Mail I Attachment ● CLIL GUI ● Compiler and its types ● Drive I Directory (Folder) / File / Path ● Menu / Popup Menu / Toolbar ● Shutdown / Reboot / Restart ● Syntax / Wild Card Characters ● Optical Fiber (Fiber Optic) . ● Net meeting ● UPS ● Printing Speed (CPS, CPM, LPM, DPI, PPM) ● Peripherals

Seminar - 5 Lectures
Expert Talk - 5 Lectures
Test - 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

2. Computer Fundamentals – By P.K.Sinha.
3. Fundamental of IT for BCA – By S.Jaiswal.
4. Engineering Physics – By V.K.Gaur.
5. Teach Yourself Assembler – By Goodwin.

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

CS-04: NETWORKING & INTERNET ENVIRONMENT		
Objective: To understand basic terms of computer networks and Internet , to give knowledge of Scripting languages like HTML, CSS and Java Script		
Unit No.	Topic	Detail
1	Introduction to Computer Network	• Computer Network • Type of Computer Network • Network Topology • OSI Reference Model (Introduction) • TCP/IP • Internet Terminology • ISP (Internet Service Provider) • Intranet • VSAT (very small aperture terminal) URL • Portal • Domain Name Server
2	Application of Internet	• World Wide Web (WWW) • Search Engine • Remote Login • Telnet • Electronic Mail (Email) • E-Commerce and E- Business • E-Governance • Mobile Commerce • Website Basics (WebPages; Hyper Text Transfer Protocol, File Transfer Protocol, Domain Names; URL; Protocol Address; Website[Static, Dynamic, Responsive etc], Web browser, Web Servers; Web Hosting. • Network Security Concepts: Cyber Law, Firewall, Cookies, Hackers and Crackers; • Types of Payment System (Digital Cash, Electronic Cheque, Smart Card, Debit/Credit Card etc)
3	Basic of HTML & Advance HTML 5	• Fundamental of HTML • Basic Tag and Attribute • The Formatting Tags • The List Tags • Link Tag • inserting special characters, • adding images and Sound,

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		• lists types of lists • Table in HTML • Frame in HTML • Forms • HTML 5 & Syntax - HTML5 Document Structure (section, article, aside, header, footer, nav, dialog, figure) - Attributes of HTML 5 - Web Form (datetime, date, month, week, time, number, range, email, url) - Audio / Video - Canvas
4	Cascading Style Sheet & CSS 3	• Introduction to CSS • Types of Style Sheets • Class & ID Selector • CSS Font Properties • CSS Text Properties • CSS Background Properties • CSS List Properties • CSS Margin Properties • CSS Comments • CSS 3 - Border Property - Background & Gradient Property - Drop Shadow Property - 2D & 3D Transform Property - Transition Property - Box Sizing Property - Position Property • Media Query
5	Java Script	• Introduction to JavaScript • Variables • JavaScript Operators • Conditional Statements • JavaScript Loops • JavaScript Break and Continue Statements • Dialog Boxes

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		• JavaScript Arrays • JavaScript User Define Function • Built in Function (string, Maths, Array, Date) • Events (onclick, ondblclick, onmouseover, onmouseout, onkeypress, onkeyup, onfocus, onblur, onload, onchange, onsubmit, onreset) • DOM & History Object • Form Validation & E-mail Validation
--	--	--

Seminar – 5 Lectures

Expert Talk – 5 Lectures

Test – 5 Lectures

Total Lectures: 60 + 15 = 75

Reference Books:

1. HTML in 10 steps or less - Laurie Ann Ulrich, Robert G. Fuller
2. Internet: The Complete Reference –Young.
3. World Wide Web Design with Html -C Xavier.
4. Internet for Every One –Leon.
5. Practical Html 5.0 -Lee Philips.
6. MCSE Networking Essential Training Guides.
7. Mastering In FrontPage – BPB.

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

CS-05 : PRACTICAL-1 (based on CS – 04 & PC Software)	
Topics	Marks
HTML-5, CSS-3, MS – Word, MS – Excel, MS – Power Point, MS-Access and Macromedia Dream weaver	100

CS-06 : PRACTICAL-2 (based on CS – 02)	
Topics	Marks
Programming in C Language	100

Note :

- Each session is of 3 hours for the purpose of practical Examination.
- Practical examination may be arranged before or after theory exam

Additional Topics (Not to be asked in examination):

Student should be aware of followings

- To Format Hard Disk
- Installation of OS, multi-OS and other packages
- Use of DOS commands
- Operating of Accounting Software

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

B.Sc.(I.T.) (Semester – 2)

SR. NO.	COURSE	No. OF LECT./Lab. PER WEEK	CREDIT
1.	CS – 07 DATA STRUCTURE USING C LANGUAGE	5	5
2.	CS – 08 WEB PROGRAMMING	5	5
3.	CS – 09 COMPUTER ORGANIZATION & ARCHITECTURE	5	5
4.	CS – 10 MATHEMATICAL AND STATISTICAL FOUNDATION OF COMPUTER SCIENCE	5	5
5.	CS – 11 PRACTICALS-1 (BASED ON CS-07)	5	5
6.	CS – 12 PRACTICALS-2 (BASED ON CS-08)	5	5
Total Credits of Semester – 2			30

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

CS-07: DATA STRUCTURE USING C LANGUAGE		
Objective: To learn algorithm analysis, data structures, sorting and searching techniques.		
Sr. No.	Topic	Detail
1	Algorithm Analysis	• The analysis of algorithm. • Time and space complexities. • Asymptotic notation. • Classes of algorithm. • Big-Oh Notation • Big-Omega Notation
	Advanced Concepts of C and Introduction To data Structures	• Data types • Arrays • Handling arrays ▪ Initializing the arrays • Multidimensional arrays ▪ Initialization of two dimensional array • Pointers ▪ Advantages and disadvantages of pointers ▪ Declaring and initializing pointers ▪ Pointer arithmetic • Array of pointers • Passing parameters to the functions • Relation between pointers and arrays • Scope rules and storage classes ▪ Automatic variables ▪ Static variables ▪ External variables ▪ Register variable • Dynamic allocation and de-allocation of memory ▪ function malloc(size) ▪ function calloc(n,size) ▪ function free(block) • Dangling pointer problem. • Structures. • Enumerated constants • Unions
2	Sorting and Searching	• Bubble sorting • Insertion sorting • Quick sorting • Bucket sorting • Merge sorting • Selection sorting

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		• Shell sorting • Basic searching technique • Index searching • Sequential searching • Binary searching
	Graph	Adjacency matrix and adjacency lists Graph traversal Depth first search (dfs) Implementation Breadth first search (bfs) Implementation • Shortest path problem • Minimal spanning tree
3	Introduction To data Structure	Primitive and simple structures Linear and nonlinear structures file organization.
	Elementary Data Structure	Stack Definition Operations on stack Implementation of stacks using arrays Function to insert an element into the stack Function to delete an element from the stack Function to display the items Recursion and stacks Evaluation of expressions using stacks Postfix expressions Prefix expression Queue Introduction Array implementation of queues Function to insert an element into the queue Function to delete an element from the queue Circular queue Function to insert an element into the queue Function for deletion from circular queue Circular queue with array implementation Dequeues Priority queues
4	Link List	Singly linked lists. Implementation of linked list Insertion of a node at the beginning Insertion of a node at the end Insertion of a node after a specified node Traversing the entire linked list Deletion of a node from linked list

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		Concatenation of linked lists Merging of linked lists Reversing of linked list Doubly linked list. Implementation of doubly linked list Circular linked list Applications of the linked lists
5	Tree	Objectives Properties of a tree Binary trees Properties of binary trees Implementation Traversals of a binary tree In order traversal Post order traversal Preorder traversal Binary search trees (bst) Insertion in bst Deletion of a node Search for a key in bst • Height balanced tree • b-tree Insertion Deletion

Seminar - 5 Lectures

Expert Talk - 5 Lectures

Test - 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

1. Data Structure through C/C++ Author : Tennaunbuam.
2. Let us C Author : Kanitkar.
3. Pointer in C Author : Kanitkar.
4. Data and File Structure Author : Trembley & Sorrenson.

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

CS-08: WEB PROGRAMMING		
Objective: - To learn web programming - Learn to develop web site using PHP		
Unit No.	Topic	Detail
1	Web Programming	- Static and Dynamic Web - Client side & Server Side Scripting - Introduction to other server side languages - Webserver (IIS & Apache) - HTTP & HTTPS protocol - FTP - Web Hosting, Virtual Host, Multi-Homing - Distributed Web Server Overview, - Document Root
	Web Services	XML and JSON - Introduction to JSON - Installation & Configuration - Resource Types - JsonSerializable - JSON Functions : json_decode, json_encode
2	PHP Basic	- Introduction to PHP - PHP configuration in IIS & Apache Web server - Understanding of PHP.INI file - Understanding of PHP .htaccess file - PHP Variable - Static & global variable - GET & POST method - PHP Operator - Conditional Structure & Looping Structure - Array - User Defined Functions: - argument function - default argument - variable function - return function - Variable Length Argument Function - func_num_args - func_get_arg, func_get_args - Variable Functions (Gettype, settype, isset, unset, strval, floatval, intval, print_r) - String Function(Chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim trim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strrev,

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		echo, print, explode(), implode(), join(), md5(), str_split(), str_shuffle(), strcspn(), strpbrk(), substr_compare(), substr_count(), ucfirst(), ucwords()) • Math Function(Abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand, cos(), acos(), sin(), asin(), tan(), atan(), bindec(), decbin(), hexdec(), dechex(), is_finite(), is_infinite(), log(), base_convert(), deg2rad()) • Date Function (Date, getdate, setdate, Checkdate, time, mktime, date_add(), date_create(), date_format(), gmtime(), localtime(), strftime(), strtotime(), strtotime(), gettimeofday()) • Array Function (Count, list, in_array, current, next, previous, end, each, sort, rsort, assort, arsort, array_merge, array_reverse, array_diff(), array_merge_recursive(), array_shift(), array_slice(), array_unique(), array_unshift(), array_keys(), array_key_exists(), array_push(), array_pop(), array_multisort(), array_search()) • Miscellaneous Function (define, constant, include, require, header, die, exit) • File handling Function (fopen, fread, fwrite, fclose, file_exists, is_readable, is_writable, fgets, fgetc, file, file_get_contents, fputcsv, fputs, file_putcontents, ftell, fseek, rewind, copy, unlink, rename, move_uploaded_file)
3	Handling Form, Session Tracking & PHP Components	• Handling form with GET & POST • Cookies • Session • Server variable • PHP Components - PHP GD Library - PHP Regular expression - Uploading file - Sending mail using mail() - Sending mail using smtp()
	AJAX	• What is AJAX • PHP with AJAX • How AJAX works with PHP • Working with AJAX as background process • Using JQuery with PHP • JQuery AJAX with PHP

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

4	Introduction of SQL	• Working with MySQL using PhpMyAdmin • SQL DML Statement (Insert, Update, Select, Delete) Command • PHP-MySQL Connectivity • PHP-MySQL Functions • mysql_connect, mysql_close, mysql_error, mysql_errno, mysql_select_db, mysql_query, mysql_fetch_array, mysql_num_Rows, mysql_affected_Rows, mysql_fetch_assoc, mysql_fetch_field, mysql_fetch_object, mysql_fetch_row, mysql_insert_id, mysql_num_fields, mysql_result, mysql_tablename, mysql_list_tables, mysql_list_fields, mysql_field_type, mysql_db_name, mysql_db_query, mysql_data_seek
5	jQuery	• What Is jQuery? • jQuery Syntax • jQuery Selector - Element Selector - Class Selector - id Selector • jQuery Events Click, dblclick, keypress, keydown, keyup, submit, change, focus, blur, load, resize, scroll, unhide • jQuery Effects hide show, fade, slide

Seminar - 5 Lectures

Expert Talk - 5 Lectures

Test - 5 Lectures

Total Lectures: 60+15=75

Reference Books:

1. Modern PHP: New Features and Good Practices by Josh Lockhart (ORELLY)
2. PHP Cookbook: Solutions & Examples for PHP Programmers by David Sklar and Adam Trachtenberg (ORELLY)
3. Programming PHP by Kevin Tatroe and Peter MacIntyre ORELLY)
4. PHP for the Web: Visual QuickStart Guide (4th Edition) by Larry Ullman (Peachpit Press)

Additional Topics (Not to be asked in examination) :

Student should be aware of followings

- Uses and Advantages of CMS
- Wordpress [Introduction & Installation]
- Joomla [Introduction & Installation]
- Magento [Introduction & Installation]

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

CS-09: COMPUTER ORGANIZATION AND ARCHITECTURE		
Objective: To learn how hardware of computer system works		
Unit No.	Topic	Detail
1	Digital Logic Circuits	• Logic Gates ▪ AND, OR, NOT, NAND, NOR, XOR, Exclusive NOR gates • Boolean Algebra ▪ Boolean algebra? ▪ Boolean variable and Boolean function (Analog and Digital Signals) ▪ Truth table ▪ Postulates ▪ Theorem related to postulates ▪ Simplified Boolean function using postulates and draw logical diagram of simplified function ▪ Simplified Boolean function using Karnaugh map method with DON'T CARE condition • Sequential And Combinational Circuits ▪ Clock pulses ▪ Combinational circuit, sequential circuit and adder • Flip Flops ▪ SR, Clocked SR, D, JK, JK – Master Slave, T • Universal Gate
2	Digital Component	• Integrated Circuits ▪ Decoders (2 X 4, 3 X 8) ▪ Encoders (Octal to Binary – 8 X 3) ▪ Multiplexer (4 X 1) ▪ Demultiplexer (1 X 4) • Register ▪ Block diagram of register ▪ Parallel register and shift register ▪ Asynchronous 4-bits Binary Counter
3	Data Representation	• Multiplication and division of two binary numbers • Floating point representation • Fixed point representation • Error Detection code – (Parity Bit)
4	Central Processing Unit	• Introduction Of CPU • Major component of CPU • General Register Organization

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

		▪ control word ▪ Accumulator Register • Stack Organization ▪ Register stack ▪ Memory stack ▪ Polish notation and reverse polish notation • Arithmetic And Logic Unit ▪ Block diagram of ALU • Interrupts
5	Input-Output Organization	• Memory buses • Block diagram and function • Data Bus, Address Bus and Control lines • Input Output Buses • Concept of input output interface • Input Out Processor (IOP) • Direct Memory Access • DMA controller

Students seminar - 5 Lectures

Expert Talk - 5 Lectures

Students Test - 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

1. Computer System Architecture – By Morris Mano (PHI).
2. Digital Logic And Computer Design – By Morris Mano.
3. Digital Computer Electronics – By Malvino And Leach.

Hands On (Not to be asked in examination):

- Instruction Formats - Simulator Base Program

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

CS-10: MATHEMATICAL AND STATISTICAL FOUNDATION OF COMPUTER SCIENCE		
Objective: • To Aware about basic Mathematics and Statistics • To develop Reasoning ability and Logical ability • To develop Arithmetic's ability • To develop a positive attitude towards learning Mathematics & statistics • To perform mathematical & statistical operations and manipulations with confidence, speed and accuracy.		
Unit No.	Topic	Details
1	Determinants	• Introduction • 2×2, 3×3 order determinant • Cramer's method for solving linear equation(Two and Three Variables) • Properties of Determinants • Examples
2	Matrices	• Introduction, • Different types of matrix(square matrix, column matrix, row matrix, Diagonal matrix. Unit matrix, null matrix), • Transpose of matrix, • Addition, subtraction & multiplication of two matrices, • Adjoint of a square matrix, • Inverse of matrix
3	Co-ordinate Geometry	• Introduction, • Quadrants & Axes, • Distance between two points in R^2(without proof), • Section formula(without proof), • Area of triangle(without proof), • Typical examples
	Set Theory	• Introduction, • Method of representation of a set, • Operation on sets & its properties(with only Logical proof), • De'Morgan laws with Logical proof, • Difference of two sets, • Cartesian products(up to two sets), • Typical examples
4	Measures of Central Tendency & Dispersion	• Mean(ungroup data, group data), • Median(ungroup data, group data), • Mode(ungroup data, group data), • Range, • Quartiles, • Standard Deviation, • Typical examples

Bachelor of Science (Information Technology) (Semester - 1 and Semester - 2)
Bhakta Kavi Narsinh Mehta University
Effective from June – 2016

5	Arithmetic & Geometric progression	- Sequence, - Series, - Arithmetic progression(Definition & Nth term, sum of n terms), - Geometric progression (Definition & Nth term, sum of n terms), - Harmonic Progression - Relation Between AM GM HM (Two Numbers) - Typical examples
----------	------------------------------------	---

Student Seminar – 5 Lectures

Expert Talk – 5 Lectures

Student Test – 5 Lectures

Total Lectures 60 + 15 = 75

Reference Books:

1. Business Mathematics By Sancheti & Kapoor Sultan & Chand
2. Statistical Method By Gupta Sultan & Chand
3. Discrete Mathematical Structures with Applications to Computer Science By J.P. Tremblay & R. Manohar TMH
4. Business Mathematics : V.K. Kapoor
5. Business Mathematics : Dr Kachot
6. Fundamentals of Statistics : S. C. Gupta

CS-11 : PRACTICAL-1 (based on CS – 07)	
Topics	Marks
DATA STRUCTURE USING C LANGUGAE	100

CS-12 : PRACTICAL-2 (based on CS – 08)	
Topics	Marks
WEB PROGRAMMING	100

Note:

- Each session is of 3 hours for the purpose of practical Examination.
- Practical examination may be arranged before or after theory exam

Additional Topics should be taught during the semester (Not to be asked in examination):

Following tools should be used to train students.

- Simulator 8051
- Using Trainer kit
- Case studies of DBMS
- Case studies of data structure

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV) Bhakta
Kavi Narsinh Mehta University
Effective from June - 2017

B.Sc. (IT) (Semester – III)			
SR.NO	SUBJECT	NO. OF LECT. PER WEEK	Credit
1	CS – 13 SAD, Software Quality Assurance and Testing	5	5
2	CS – 14 C++ and Object Oriented Programming	5	5
3	CS – 15 RDBMS Using Oracle	5	5
4	CS – 16 Content Management System using Word Press	5	5
5	CS – 17 Practical (Based On CS-13, CS-14)	5	5
6	CS – 18 Practical (Based On CS-15, CS-16,)	5	5
Total Credits			30

Note:

1. Credit of each subject is 5. Total credit of semester is 30.
2. Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
3. Total marks of each practical paper are 100. No internal examination marks in practical papers.

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS – 13 : SAD, Software Quality Assurance and Testing				
No.	Topics	Details	Marks weight In %	Min Lect.
1	System Analysis & Design AND Software Engineering, Concepts of Quality Assurance	- Definitions: System, Subsystem, Business System, Information System (Definitions only) - Systems Analyst (Role: Information Analyst, Systems Designer & Programmer Analyst) - SDLC - Fact – finding techniques (Interview, Questionnaire, Record review and observation) - Tools for Documenting Procedures and Decisions Decision Trees and Decision Tables - Data Flow analysis Tool DFD (context and zero level) and Data Dictionary - Software Engineering (Brief introduction) - Introduction to QA - Quality Control (QC) - Difference between QA and Q - Quality Assurance activities	20	13

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

2	Basics of Software Testing, Types of Software Testing, Verification and Validation	▪ Introduction to software Testing ▪ Software faults and failures • Bug/Error/Defect/Faults/Failures ▪ Testing Artifacts • Test case • Test Script • Test Plan • Test Harness • Test Suite ▪ Static Testing • Informal Review • Walthrough • Technical Review • Inspection ▪ Dynamic Testing ▪ Test levels • Unit Testing • Integration Testing • System Testing • Acceptance Testing Techniques of software Testing ▪ Black Box Testing • Equivalence Partitioning • Boundary Data Analysis • Decision Table Testing • State Transition Testing ▪ White Box Testing • Statement testing and coverage • Decision testing and coverage ▪ Grey Box Testing ▪ Nonfunctional Testing • Performance Testing • Stress Testing • Load Testing • Usability Testing • Security Testing	20	15
---	---	---	-----------	-----------

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

3	Software Development Life Cycle Models, Automated Testing	▪ Waterfall Model ▪ Iterative Model ▪ V-Model ▪ Spiral Model ▪ Big Bang Model ▪ Prototyping Model ▪ Introduction • Concept of Freeware, Shareware, licensed tools ▪ Theory and Practical Case-Study of Testing Tools • Win runner • Load runner • QTP • Rational Suite	20	12
4	Project Economics, Project scheduling and Tracking	▪ Concepts of Project Management ▪ Project Costing based on metrics ▪ Empirical Project Estimation Techniques. ▪ Decomposition Techniques. ▪ Algorithmic methods. ▪ Automated Estimation Tools ▪ Concepts of project scheduling and tracking ▪ Effort estimation techniques ▪ Task network and scheduling methods ▪ Timeline chart ▪ Pert Chart ▪ Monitoring and control progress ▪ Graphical Reporting Tools	20	10

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

5	CAD Project Management Tool, UML	▪ MS – VISIO for designing & Documentation ▪ MS – Project for controlling and Project Management ▪ UML designing and skill based tools Overview of ◆ Class Diagram ◆ Use Case Diagram ◆ Activity Diagram	20	10
TOTAL			100	60

Students seminar - 5 Lectures.

Expert Talk - 5 Lectures

Students Test - 5 Lectures.

TOTAL LECTURES 60+15=75

Reference Book

1. Analysis & Design of Information System - James A. Senn.
2. Pankaj Jalote, "Software Engineering – A Precise Approach", Wiley India
3. UML Distilled by Martin Fowler, Pearson Edition, 3rd Edition
4. Fundamentals of Software Engineering – Rajib Mall (PHP)
5. Software Engineering – A Practitioner's Approach – Pressman
6. UML – A Beginner's Guide – Jasson Roff – TMH
7. Roger Pressman, "Software Engineering"
8. http://en.wikipedia.org/wiki/Software_testing
9. <http://www.onestoptesting.com/>
10. <http://www.opensourcetesting.org/functional.php>

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS - 14 : C++ and Object Oriented Programming				
No	Topics	Details	Marks weight in %	App. Lect.
1	Principles of object oriented programming Tokens, expressions and control statements	• Procedure – oriented programming • Object oriented programming paradigm • Basic concepts of object oriented Programming • Benefits of object oriented programming • Application of object oriented programming • What is c++? • Application of c++ • Input/output operators • Structure of c++ program • Introduction of namespace • Tokens : keywords, identifiers, basic data types, user- defined types, derived data types, symbolic constants, type compatibility, declaration of variables, dynamic initialization of variables, reference variables • Operators in C++: scope resolution operator, member referencing operator, memory management operator, manipulators, type cast operator. • Expression : Expression and their types, special assignment operator, implicit conversions, operator precedence • Control structures ◆ Conditional control structure :- simple if, if...else , nested if else, switch etc. ◆ Looping control structure:- for, while , do...while	20	15
	Functions in C++	• The main function • Function prototype • Call by reference • Return by reference • Inline function • Default arguments • Const arguments		

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

		• Functions overloading • Adding C Functions turbo C++		
2	Classes and Objects, Constructor and Destructor	• C structures revisited • Specifying a class • Local Classes • Nested Classes • Defining member functions, nesting of Member functions, private member function, making outside function inline • Arrays within a class • Memory allocation for objects • Static data member • Static member functions • Arrays of objects • Objects as function arguments • Friendly functions • Returning objects • Const member function • Pointer to members	20	12
		• Characteristics of constructor • Explicit constructor • Parameterized constructor • Multiple constructor in a class • Constructor with default argument • Copy constructor • Dynamic initialization of objects • Constructing two dimensional array • Dynamic constructor • MIL , Advantage of MIL • Destructors		

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

3	Operator overloading and type conversion, Inheritance	• Concept of operator overloading • Over loading unary and binary operators • Overloading of operators using friend Function • Manipulation of string using operators • Rules for operator overloading • Type conversions. • Comparison of different method of conversion • Defining derived classes • Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid) • Virtual base class & Abstract class • Constructors in derived class • Application of Constructor and Destructor in inheritance • Containership, Inheritance V/s Containership	20	11
4	Pointer, Virtual functions and Polymorphism, RTTI Console I/O operations	• Pointer to Object • Pointer to derived class • this pointer • Rules for virtual function • Virtual function and pure virtual function. • Default argument to virtual function • Run Time Type Identification • C++ streams • C++ stream classes • Unformatted and formatted I/O operations • Use of manipulators.	20	10

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

5	Working with Files, Exception handling, Introduction to Template STL	• File stream classes • Opening and closing a file • Error handling • File modes • File pointers • Sequential I/O operations • Updating a file (Random access) • Command line arguments • Overview of Exception Handling • Need for Exception Handling • various components of exception handling • Overview of Exception Handling • Introduction to templates • Class templates • Function templates • Member function templates • Overloading of template function • Non-type Template argument • Primary and Partial Specialization • Introduction to STL • Overview of iterators, containers	20	12
TOTAL			100	60

Students seminar - 5 Lectures.
Expert Talk - 5 Lectures
Students Test - 5 Lectures.
TOTAL LECTURES 60+15=75

Reference Books:

1. Complete Reference C++ by Herbert Schildt McGraw Hill Publications
2. Computer Science- A Structured approach using C++ by Forouzan, Gilburg, THOMSON
3. Object Oriented Programming in C++ - E.Balagurusamy, BPB
4. Object Oriented programming in C++ by Robert Lafore, Pearson Education
5. Mastering C++ - Venugopal
6. The C++ Programming Language by Bjarne Stroustrup, Pearson Education
7. Object Oriented Programmin in C++ - Robaret Laphore
8. Let us C++ - Yashvant Kanitkar, BPB

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS – 15 : RDBMS Using Oracle				
No.	Topics	Details	Marks weight In %	Min Lect.
1	DBMS Overview, SQL, SQL*Plus	• Introduction to DBMS • Introduction to RDBMS • Dr.E.F.Codd Rules • Importance of E.R.Diagram in Relational DBMS. • Normalization • Introduction to SQL • SQL Commands and Datatypes • Introduction to SQL*Plus • SQL*Plus formatting commands • Operator and Expression • SQL v/s SQL*Plus	20	10
2	Managing Tables and Data, Data Control And Transaction Control Command	• Creating , Altering & Dropping tables • Data Manipulation Command like • Insert, update, delete • Different type of constraints and applying of constration • SELECT statement with WHERE, GROUP BY and HAVING,ROLLUP AND CUBE, ORDER BY, DISTINCT, Special operator like IN, ANY, ALL, BETWEEN, EXISTS, LIKE • Join (Inner join ,outer join, self join) • subquery, minus, intersect, union • Built in functions • Numeric Function abs, ceil, cos, decode, exp, floor, greatest, least, log, log10, max, min, rem, round , sign, sin, sinh, sqrt, tan, trunc • Character Function chr, concat, initcap, lower, lpad, ltrim, replace, rpad, rtrim, soundex, substr, treat, trim, upper • Date Function add_months, last_day, months_between, next_day, round (date), sysdate, systimestamp, trunc (date), to_date, to_char • Aggregate function Sum, Count, AVG, MAX, MIN • General Functions COALESCE, CASE WHEN, DECODE • Creating user & role	20	15

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

		• Grant, Revoke command • What is transaction? • Starting and Ending of Transaction - Commit, Rollback, SavePoint		
3	Other ORACLE Database Objects, Concurrency control using lock	• View • Sequence • Synonyms, • Database Links • Index ○ B*Tree Indexes ○ Bitmap Indexes ○ Function-Based Indexes ○ Application Domain Indexes • Cluster, • Snapshot • What Are Locks? • Locking Issues ○ Lost Updates ○ Pessimistic Locking ○ Optimistic Locking ○ Blocking ○ Deadlocks ○ Lock Escalation • Lock Types ○ DML Locks ○ DDL Locks ○ Latches ○ Manual Locking and User-Defined Locks	20	10
4	Introduction to PL/SQL, Advanced PL/SQL	• SQL v/s PL/SQL • PL/SQL Block Structure • Language construct of PL/SQL (Variables, Basic and Composite Data type, Conditions looping etc.) • %TYPE and %ROWTYPE • Using Cursor(Implicit, Explicit) • Exception Handling • Creating and Using Procedure, Functions, • Package, • Triggers • Creating Objects, • Object in Database-Table • PL/SQL Tables, Nested Tables, Varrays	20	15

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

5	Oracle Database Structure and Storage Database, Resource Management and Task Scheduling	• Instance Architecture ○ Database Processes ○ Memory Structure. ○ Data files • Creating & Altering Database • Opening & shutdown Database • Initialization Parameter • Control Files, Redo Logs files • Tablespace(Create, Alter, Drop) • Rollback Segment (Create, Alter) (System & Transaction RBS) • Oracle Blocks • Import • Export • SQL*Loader • Managing Automated Database Maintenance Tasks • Managing Resources with Oracle Database Resource Manager • Oracle Scheduler Concepts • Scheduling Jobs with Oracle Scheduler • Administering Oracle Scheduler	20	10
	Total		100	60

Students seminar - 5 Lectures.

Expert Talk - 5 Lectures (Managing a Multitenant Environment using Oracle 12c)

Students Test - 5 Lectures.

TOTAL LECTURES 60+15=75

Reference Books:

1. Oracle Database 12c The Complete Reference (Oracle Press) by Bob Bryla , Kevin Loney – Oracle Press
2. Oracle Database 12c SQL – Jason Price – Oracle Press
3. Oracle Database 12c PL/SQL Programming by McLaughlin – Oracle Press
4. SQL,PL/SQL The programming - Lang.Of Oracle Ivan Bayross - BPB

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS – 16: Content Management System using Word Press Word Press				
No.	Topic	Details	Marks weight In %	Min. Lect.
1	OOP	- Concept of oop • Class • Property • Visibility • Constructor • Destructor • Inheritance • Scope Resolution Operator (::) • Autoloading Classes • Class Constants - Mysql Database handling with oop (insert, update, select, delete)	10	6
2	Introduction Installation & Configuration	What is Content Management System (CMS)? - Introduction of Wordpress - Features of Wordpress - Advantages & Disadvantages of Wordpress - Installation of wordpress. - Wordpress Directory & file structure. - Dashboard overview - How to add, edit and delete page, category, post, tag. - Add new media file (image, pdf, doc etc.) & attach to post or page. - User Roles and Capabilities. - Setting (General, writing, Reading, Discussion, Media, Permalinks) - Updating wordpress • One-click Update • Manual Update - Database Structure	15	9
3	Theme	- What is theme? - How to install & activate theme. - Introduction of common WordPress theme template files.	25	15
	Widget	- What is widget & widget Areas? - Widget Management • Available Widgets (Archive, Calendar, Categories, Custom Menu, Meta, Pages, Recent Comments, Recent Posts, RSS, Search, Tag Cloud, Text) • Inactive Sidebar (not used) • Inactive Widgets		

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

	Plugin	- What is plugin? - How to install and activate plugin. - Useful plugins for website. • Seo yoast • Contact form 7 • Woocommerce • WP Super Cache • Regenerate Thumbnails • Advanced Custom Fields		
4	Theme development	- Anatomy of a Theme: header.php, footer.php and sidebar.php - Template Files (style.css, index.php, page.php, home.php, archive.php, single.php, comments.php, search.php, attachment.php, 404.php, category.php, tag.php, author.php, date.php) - The Loop (have_posts (), the_post()) - Template Tags 1. General tags (wp_head(), get_footer(), get_header(), get_sidebar(), get_search_form(), bloginfo(), wp_title(), single_post_title(), wp_footer(), comments_template(), add_theme_support(), get_template_directory_uri(), body_class()) 2. Author tags (the_author(), get_the_author(), the_author_link(), get_the_author_link(), the_author_meta(), the_author_posts()) 3. Category tags (category_description(), single_cat_title(), the_category()) 4. Link tags (the_permalink(), get_permalink(), home_url(), get_home_url(), site_url(), get_site_url()) 5. Post tags (the_content(), the_excerpt(), the_ID(), the_tags(), the_title(), get_the_title(), the_date(), get_the_date(), the_time(), next_post_link(), previous_post_link(), posts_nav_link(), post_class()) 6. Post Thumbnail tags (has_post_thumbnail(), get_post_thumbnail_id(), the_post_thumbnail(), get_the_post_thumbnail())	30	18

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

		7. Navigation Menu tags (wp_nav_menu()) 8. Conditional Tags (is_archive(), is_category(), is_front_page(), is_home(), is_page(), is_single(), is_search(), is_attachment(), is_active_sidebar()) - functions.php file		
5	Advanced development	- Advanced functions • add_action() • add_filter() • add_shortcode() • do_shortcode() • register_nav_menu() - Custom Post Types • register_post_type() • register_taxonomy() - Widget Area • register_sidebar() dynamic_sidebar()	20	12
TOTAL:			100	60

Students seminar - 5 Lectures.
Expert Talk - 5 Lectures
Students Test - 5 Lectures.

TOTAL LECTURES 60+15=75

Reference Books:

1. Build Your Own Wordpress Website: An Ultimate Guide for Small Business Owners Paperback by Wordpress Genie
2. Teach Yourself VISUALLY Word Press Paperback –by George Plumley 3rd Edition.
3. Wordpress for Beginners 2017: A Visual Step-by-step Guide to Mastering Word press Paperback –by Dr. Andy Williams.
4. Wordpress to Go: How to Build a Wordpress Website on Your Own Domain, from Scratch, Even If You Are a Complete Beginner Paperback –by Sarah Mcharry (Author)

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS-17 : Practical Based On CS – 13 & CS – 14		
Sessions	Topics	Marks
I	♦ CS – 13	50
II	♦ CS – 14	50

Note : Each session is of 3 hours for the purpose of practical examination.

CS-18 : Practical And Viva Based On CS – 15 & CS – 16		
Sessions	Topics	Marks
I	♦ CS – 15	50
II	♦ CS – 16	50

Note : Each session is of 3 hours for the purpose of practical examination.

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

B.Sc. (IT) (Semester – IV)			
SR.NO	SUBJECT	NO. OF LECT. PER WEEK	CREDIT
1	CS – 19 Programming with JAVA	5	5
2	CS – 20 Programming with C#	5	5
3	CS – 21 Network Technology and Administration	5	5
4	CS –22 Operating Systems Concepts With Unix / Linux	5	5
5	CS – 23 Practical (Based On CS- 19, CS-22)	5	5
6	CS – 24 Practical (Based On CS- 20)	5	5
Total Credit			30

Note:

1. Credit of each subject is 5. Total credit of semester is 30.
2. Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
3. Total marks of each practical paper are 100. No internal examination marks in practical papers.

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS – 19 PROGRAMMING WITH JAVA				
No	Topics	Details	Marks weight In %	Min Lec.
1	History, Introduction and Language, Basics Classes and Objects	- History and Features of Java - Java Editions - JDK, JVM and JRE - JDK Tools - Compiling and Executing basic Java Program - Java IDE (NetBeans and Eclipse) - Data Type (Integer, Float, Character, Boolean) - Java Tokens (Keyword, Literal, Identifier, Whitespace, Separators, Comments, Operators) - Operators (Arithmetic, Relational, Boolean Logical, Bitwise Logical, Assignment, Unary, Shift, Special operators) - Type Casting - Decision Statements (if, switch) - Looping Statements (for, while, do..while) - Jumping Statements (break, continue, return) - Array (One Dim., Rectangular, Jagged) - Command Line Argument Array	20	10
		- OOP Concepts (Class, Object, Encapsulation, Inheritance, Polymorphism) - Creating and using Class with members - Constructor - finalize() method - Static and Non-Static Members - Overloading (Constructor & Method) - Varargs		

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

2	Inheritance, Java Packages	- Universal Class (Object Class) - Access Specifiers (public, private, protected, default, private protected) - Doing Inheritance - Constructors in inheritance - Method Overriding - Interface - Nested and Inner Class - Abstract and Final Class - Normal import and Static Import - Introduction to Java API Packages and imp. Classes - o java.lang - o java.util - o java.io - o java.net - o java.awt - o java.awt.event - o java.applet - o java.swing - java.lang Package Classes (Math, Wrapper Classes, String, String Buffer) - java.util Package Classes (Random, Date, GregorianCalendar, Vector, HashTable, StringTokenizer) - Creating and Using UserDefined package and sub-package	20	15
3	Exception Handling, Threading and Streams (Input and Output)	- Introduction to exception handling - try, catch, finally, throw, throws - Creating user defined Exception class - Thread and its Life Cycle (Thread States) - Thread Class and its methods - Synchronization in Multiple Threads (Multithreading) - Deamon Thread, Non-Deamon Thread	20	10
		- Stream and its types (Input, Output, Character, Byte) - File and RandomAccessFile Class - Reading and Writing through Character Stream Classes (FileReader, BufferedReader, FileWriter, BufferedWriter) - Reading and Writing through Byte Stream Classes (InputStream,		

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

		FileInputStream, BufferedInputStream, DataInputStream, OutputStream, FileOutputStream, BufferedOutputStream, DataOutputStream) - StreamTokenizer Class - Piped Streams, Bridge Classes : InputStreamReader and OutputStreamWriter - ObjectInputStream, ObjectOutputStream		
4	Applets	- Introduction to Applet - Applet Life Cycle - Implement & Executing Applet with Parameters - Graphics class	20	10
	Layout Managers	- FlowLayout - BorderLayout - CardLayout - GridLayout - GridBagLayout with GridBagConstraints - Intro. to BoxLayout, SprigLayout, GroupLayout - Using NO LAYOUT Manager		

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

5	GUI using SWING Event Handling	- Introduction to AWT and Swing - Difference Between AWT and Swing Components - Swing Components - o JFrame, JPanel - o JLabel, JButton, JRadioButton, JCheckBox - o JTextField, JPasswordField, JTextArea - o JScrollBar, JComboBox, JList - o Menus (JMenuBar, JMenu, JMenuItem) - Introduction to Event Handling - Event Delegation Model - Event Packages - o AWT Event Package - o Swing Event Package - Event Classes (ActionEvent, ItemEvent, FocusEvent, MouseEvent, MouseWheelEvent, TextEvent, WindowEvent, etc.) - Listener Interfaces (ActionListener, ItemListener, FocusListener, KeyListener, MouseListener, MouseMotionListener, TextListener, WindowListener, etc.) - Adaptor Classes (FocusAdaptor, KeyAdaptor, MouseAdaptor, MouseMotionAdaptor)	20	15
		Total	100	60

Students seminar - 5 Lectures.
Expert Talk - 5 Lectures
Students Test - 5 Lectures.

TOTAL LECTURES 60+15=75

Reference Books:

1. Java: A Beginner's Guide – Jul 2014 by Herbert Schildt
2. Java Programming (Oracle Press) by Poornachandra Sarang
3. Java The Complete Reference, 8th Edition –by Herbert Schildt
4. Ivor Horton's "Beginning Java 2" JDK 5 Edition, Wiley Computer Publishing.
5. Ken Arnold, James Gosling, David Holmes, "The Java Programming Language", Addison-Wesley Pearson Education.
6. Cay Horstmann, "Big Java", Wiley Computer publishing (2nd edition – 2006).
7. James Gosling, Bill Joy, Guy Steele, Gilad Bracha, "The Java Language Specifications", Addison-Wesley Pearson Education (3rd edition) Download at <http://docs.oracle.com/javase/specs/>

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS – 20 PROGRAMMING WITH C#				
No	Topics	Details	Marks weight In %	Min Lec.
1	.NET Framework and Visual Studio IDE, Language Basics	Introduction to .NET Framework Features / Advantages CLR, CTS and CLS BCL / FCL / Namespaces Assembly and MetaData JIT and types Managed Code and Unmanaged Code Introduction to .NET Framework and IDE versions Different components (windows) of IDE Types of Projects in IDE (Console, Windows, Web, Setup, etc.) Data Types (Value Type & Reference Type) Boxing and UnBoxing Operators (Arithmetic, Relational, Bitwise, etc.) Arrays (One Dimensional, Rectangular, Jagged) Decisions (If types and switch case) Loops (for, while, do..while, foreach)	20	10

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

2	Class and Inheritance, Property, Indexer, Pointers, Delegates, Event, Collections	Concept of Class, Object, Encapsulation, Inheritance, Polymorphism Creating Class and Objects Methods with “ref” and “out” parameters Static and Non-Static Members Constructors Overloading Constructor, Method and Operator Inheritance Sealed Class & Abstract Class Overriding Methods Interface inheritance Creating and using Property Creating and using Indexer Creating and using Pointers (unsafe concept) Creating and using Delegates (Single / Multicasting) Creating and using Events with Event Delegate Collections (ArrayList, HashTable, Stack, Queue, SortedList) and their differences.	20	15
3	Windows Programming	Creating windows Application MessageBox class with all types of Show() method Basic Introduction to Form and properties Concept of adding various Events with event parameters Different Windows Controls - Button - Label - TextBox - RadioButton - CheckBox - ComboBox - ListBox - PictureBox - ScrollBar - TreeView - Menu (MenuStrip, ContextMenuStrip) - ToolStrip - Timer - Panel and GroupBox	20	15

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

		Dialog Boxes (ColorDialog, FontDialog, SaveFileDialog and OpenFileDialog) MDI Concept with MDI Notepad Concept of Inheriting Form		
4.	Database Programming with ADO.NET	Concept of Connected and Disconnected Architecture Data Providers in ADO.NET Connection Object Connected Architecture - Command - DataReader Disconnected Architecture - DataAdapter - DataSet - DataTable - DataRow - DataColumn - DataRelation - DataView Data Binding GridView Programming	20	12
5	User Controls (Components), Crystal Reports, Setup Project	Creating User Control with - Property - Method - Event Using User Control in Windows, Projects as component, Creating Crystal Reports Types of Reports Report Sections Formula, Special Field and Summary in Report Types of Setup Projects Creating Setup Project - File System Editor - User Interface Editor - Launch Conditions Editor	20	8
		Total	100	60

Students seminar - 5 Lectures
 Expert Talk - 5 Lectures
 Students Test - 5 Lectures
TOTAL LECTURES 60+15=75

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

REFERENCE BOOKS

1. Pro C# 5.0 and .NET 4.5 Framework **(By: Andrew Troelsen)**
2. Head First C# - **(By: Jennifer Greene, Andrew Stellman)**
3. C# 5.0 Unleashed - **(By: Bart De Smet)**
4. Adaptive Code Via C# **(By: Gary McLean Hall)**
5. C#.NET Programming Black Book - steven holzner –dreamtech publications
6. Introduction to .NET framework - Wrox publication
7. Microsoft ADO. Net - Rebecca M. Riordan, Microsoft Press

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS – 21 NETWORK TECHNOLOGY AND ADMINISTRATION				
No	Topics	Details	Marks weight In %	Min Lec.
1	Basics of Network, Network Models and LAN Sharing	• Network concepts - What is network - Use of network • Network model -peer – to – peer -client – server • Network Services - File service, - Print service, - Comm. service, - Data base service, - Security service, - Application service • Network Access Methods - csma / cd, csma / ca, - Token passing - Polling • Network Topologies - Bus, Ring, Star, Mesh, Tree, Hybrid • Advanced □ □ Network Topologies Ethernet, CDDI, FDDI • Communication Methods - Unicasting - Multicasting - Broadcasting • OSI reference model with 7 layers • TCP/IP network model with 4 layers • File And Print Sharing in LAN. • aping of network drive • Disk quota • Encryption • Compression • Net meeting	20	12

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

2	Transmission Media Multiplexing & Switching Concepts Network devices	• Transmission Media - Types of Transmission media - Guided media - Co – Axial Cable, - Twisted Pair Cable, - Crimping of Twisted pair cable - Fiber Optic Cable • Unguided media - Infrared, Laser, Radio, Microwave, Bluetooth tech. • Different Frequency Ranges • Multiplexing & Demultiplexing • Multiplexing Types - FDM, - TDM, - CDM, - WDM • Switching Tech. - Circuit Switching, - Message Switching, - Packet Switching • CABLE NETWORK DEVICES • LAYER1 DEVICES - LAN CARD, - MODEM , - DSL & ADSL - HUB(Active,Passive,Smart hub) - REPEATER • LAYER2 DEVICES - SWITCH(Manageable, nonmanagable) - BRIDGE(Source route, Transactional) • LAYER3 DEVICES - ROUTER - LAYER3 SWITCH - BROUTER - GATEWAY - Network Printer • WIRELESS NETWORK DEVICES - Wireless switch - Wireless router, ACCESSPOINT	20	15
----------	---	---	----	----

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

3	Network Protocols, Network Routing	• Packets & Protocols • ☐ Conn. Oriented protocols -TCP& connection less protocols-UDP • TCP/IP STACK - HTTP - FTP - SMTP - POP3 - SNMP - TELNET - ARP - RARP • IPX/SPX • AppleTalk, • NetBIOS Name PROTOCOL • L2CAP, RFCOMM Protocol • What is routing • Requirements of routing • Types of Routing - static - dynamic - default • Routing protocols - Exterior Routing protocol 1)BGP - Interior Routing protocol (1)Distance vector routing - RIP - IGRP - EIGRP (2)Link state routing - OSPF - IS IS	20	10
----------	---	--	----	----

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

4	IP ADDRESSING, Windows 2008 server	• What is ip address? • Types of ip address • □ ipv4 - Class structure - subneting, supernetting • ipv6 - Basic structure of ipv6 - Implementation of ipv6 • Migration from ipv4 to ipv6 • Installation of 2008 enterprise server • Various editions of windows 2008 server • Installation & Configuration of Active Directory - Domains, Trees, Forests concept • Accounts(User, Group, Computer) • Policy (Security and audit) • Logging Events • MMC(Microsoft Management console)	20	11
----------	---	---	----	----

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

5	Basics of Network Security, Internet connection & Sharing	• Fundamental of Network Security • Requirements of network Security • Policies, Standard, Procedures, Baselines, Guide lines • Security methods - Encryption - Cryptography - Authentication • Security Principle –CIA Model • Basics of Internet • How internet is connecting with computer • Technology related internet - Dial up tech. - ISDN network tech. - Lease line tech. • VPN - Types of VPN - Use of VPN - VPN protocols (PPTP, L2TP, IPsec.) • Proxy server, Firewall • GPS, GPRS • CCTV tech.	20	12
		Total	100	60

Students seminar - 5 Lectures

Expert Talk - 5 Lectures

Students Test - 5 Lectures

TOTAL LECTURES 60+15=75

Reference Books:

1. Networking Essential - Glenn Berg Tech. Media
2. MCSE Self-Paced Training Kit (Server 2003)
3. Data Communication and Networking - B A Forouzan

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS – 22 : Operating Systems Concepts With Unix / Linux				
No	Topics	Details	Marks weight In %	App. Lect
1	Introduction, Process Management, Memory Management	• Meaning of OS • Functions of OS • Features of OS • OS Types (User Point of View) • OS Types (Features Point of View)	20	12
		• Introduction of OS process • Process State Transition Diagram • Process Scheduling ○ FCFS ○ SJN ○ Round Robin ○ Priority Base Non Preemptive ○ Priority Base Preemptive		
		• Physical Memory and Virtual Memory • Memory Allocation • Contiguous Memory Allocation • Noncontiguous Memory Allocation • Virtual Memory Using Paging • Virtual Memory Using Segmentation		
2	Getting Started with Unix, Unix Shell Command, Text Editing With vi Editor,	• Unix Architecture • Unix Features • Types Of Shell (C, Bourn, Korn) • Unix File System • Types Of Files ○ Ordinary Files ○ Directory Files ○ Device Files • Unix File & Directory Permissions	20	17
		• Connecting Unix Shell : Telnet • Login Commands passwd, logout, who, who am i, clear • File / Directory Related Command ls, cat, cd, pwd, mv, cp, ln, rm, rmdir, mkdir, umask, chmod, chown, chgrp, find, pg, more, less, head, tail, wc, touch • Operators in Redirection & Piping ○ < ○ > ○ << ○ >> ○		

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

		• Advance Tools • Finding Patterns in Files grep,fgrep,egrep • Working with columns and fields cut,paste,join • Tools for sorting sort,uniq • Comparing files : cmp,comm.,diff • Changing Information in Files : tr,sed, • Examining File Contents : od • Tools for mathematical calculations bc,factor • Monitoring Input and Output tee,script • Tools For Displaying Date and Time cal,date • Communications telnet,wall,mtod,write,mail,news,finger • Process Related Commands : ps, command to run process in background, nice,kill,at,batch,cron, crontab,wait,sleep • Concept of Mounting a File System mount command • Concept of DeMounting a File System umount command • Introduction of vi editor • Modes in vi • Switching mode in vi • Cursor movement • Screen control commands Entering text, cut, copy, paste in vi editor		
--	--	---	--	--

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

3	Shell Programming Getting Started with Linux, Linux Booting	• Shell Keywords • Shell Variables • System variables PS2, PATH, HOME, LOGNAME, MAIL, IFS, SHELL, TERM, MAILCHECK • User variables set, unset and echo command with shell variables • Positional Parameters • Interactive shell script using read and echo • Decision Statements ○ if then fi ○ if then else fi ○ if then elif else fi ○ case esac • test command • Logical Operators • Looping statements ○ for loop ○ while loop ○ until loop ○ break, continue command • Arithmetic in Shell script • Various shell script examples	20	16
4	Working with X- Windows (Ubuntu)	• History of Linux • GNU, GPL Concept • Open Source & Freeware • Structure and Features of Linux • Installation and Configuration of Linux - Using with Ubuntu • Startup, Shutdown and boot loaders of Linux	20	7

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

		- KDE - Purpose of window manager • The KDE Desktop - KDE Panel - Desktop Icons - Managing Windows - The KDE Control Panel • The GNOME Desktop - The GNOME Panel - Desktop Icons - Managing Windows - The GNOME Control Panel • Configuring X - /etc/X11/Xorg.conf file - Tuning Xorg.conf - Choosing a Window Manager • Create, Delete, Rename, Copy files and folders • Install / Uninstall Software		
5.	Linux Admin (Ubuntu)	• Creating Linux User Account and Password • Installing and Managing Samba Server • Installing and Managing Apache Server • Optimizing LDAP Services • Optimizing DNS Services • Optimizing FTP Services • Optimizing Web Services • Configure Ubuntu's Built-In Firewall • Working with WINE	20	8
		Total	100	60

Students seminar - 5 Lectures.
Expert Talk - 5 Lectures
Students Test - 5 Lectures.

TOTAL LECTURES 60+15=75

Reference Books

1. Stalling W, "Operating Systems", 7th edition, Prentice Hall India.
2. Silberschatz, A., Peter B. Galvin and Greg Gagne, "Operating System Principles", Wiley-Indian Edition, 8th Edition
3. Unix Shell Programming - Y. Kanetkar- BPB Publications
4. Unix concepts and applications- Sumitabha Das

Hands-On (Not to be asked in the examination)

- ◆ Installation of Unix / Linux
- ◆ User and Group Creation
- ◆ Demo of Various Applications available in Unix / Linux like Star Office, Games and other productivity tools.
- ◆ Demo of GNOME, KDE Desktops in Linux.

Bachelor of Science (Information Technology)
(Semester – III and Semester - IV)
Bhakta Kavi Narsinh Mehta University
Effective from June - 2017

CS - 23 : Practical based on CS – 19 & CS – 22		
Sessions	Topics	Marks
I	♦ CS – 19	50
II	♦ CS – 22	50

Note : Each session is of 3 hours for the purpose of practical examination.

CS - 24 : Practical Based on CS –20		
Sessions	Topics	Marks
I	♦ CS – 20	100

Note : Each session is of 3 hours for the purpose of practical examination.

**BHAKTA KAVI NARSINH MEHTA UNIVERSITY
JUNAGADH**



Bachelor of Science (Information Technology)

B.Sc. (I.T.)

Syllabus of Semester - V & Semester - VI

(Effective from: June – 2018)

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

B. Sc.(IT) Semester - V

SR.NO	SUBJECT	NO. OF THEORY PER WEEK	NO. OF PRACTICALS PER WEEK
1	CS-25 PROGRAMMING WITH ASP.NET	5	-
2	CS-26 ADVANCED JAVA PROGRAMMING	5	-
3	CS-27 SEARCH ENGINE TECHNIQUES AND DIGITAL TECHNOLOGY TRENDS	5	-
4	CS-28 PRACTICALS (BASED ON CS- 26)	-	6
5	CS-29 PRACTICALS (BASED ON CS-25 and cs-27)		6
6	CS-30 PROJECT DEVELOPMENT	-	6

Note:

1. Credit of each subject is 5. Total credit of semester is 36.
2. Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
3. Total marks of each practical and project-viva paper are 100. No internal examination marks in practical and project-viva papers.

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI
Effective from June – 2018

CS – 25 Programming with ASP.Net				
No	Topics	Details	Weightage in %	Min Lec
1.	Framework & Web Contents	Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications Web servers, installation of IIS. Web forms, web form controls server controls, client controls, web forms & HTML, Adding controls to a web form ,Buttons, Text Box , Labels, Checkbox, Radio Buttons, List Box, etc. Running a web Application, creating a multiform web project.	20	12
2.	Validation & State Management	Form Validation Client side validation, server Side validation Validation Control Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control. State management View state, Session state, Application state	20	12
3.	ADO.Net Database & LINQ	Architecture of ADO.NET Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, DataAdapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls.	20	12

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BECHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

		Language Integrated Query(LINQ)		
4.	Using XML	Writing datasets to XML, Reading datasets with XML. Web services Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web service, Web Application deployment.	20	12
5.	Web Application and Configuration	Overview Asp.net Configuration, Common Configuration , Tracing, Custom Error, Authentication & Authorization, AJAX Web Services	20	12
			100	60

Student Seminar : 05 Lectures
Expert Talk : 05 Lectures
Student Test : 05 Lectures
Total : 75 Lectures

References

ASP.Net – Unleashed

ASP.Net - Wrox Publications

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

CS-26 : ADVANCED JAVA PROGRAMMING				
NO	TOPIC	DETAILS	Weightage in %	APPROX. LECT.
1	Distributed Computing using RMI, Database Programming with JDBC	• Introduction to RMI • RMI Architecture • Stubs and Skeleton	5	3
		• Introduction and Need for JDBC • Database Drivers • JDBC APIs for database Connectivity (Java.sql Package) • Connection • Statement • Prepared statement • Callable statement • Result set • Other JDBC APIs • Database Meta Data • Result Set Meta Data	15	9
2	Servlet Programming	• Servlet Basics, Basic Servlet structure, Servlets Generating text/html content, Packaging Servlets, The servlet life-cycle. • Handling Client Request Form Data, Reading Form Data from Servlets, Handling Client Request, Reading Request Headers, Understanding HTTP/1.1 Request Headers, Changing the page according to how the user got there, Accessing the Standard CGI Variables. • Generating the Server Response, HTTP Status Codes, Specifying Status Codes, HTTP / 1.1 Status Codes, Using Redirections, HTTP Response Headers, Setting Response Headers from Servlets, Understanding HTTP / 1.1 Response Headers, Using Servlets	20	12

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BECHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI
Effective from June – 2018

		to Generate JPEG Images. Handling Cookies, Remembering Usernames and Passwords, Deleting Cookies, Sending and Receiving Cookies, Using Cookie Attributes, Differentiating Session Cookies from Persistent Cookies, Using Cookies to Remember User Preferences, Session Tracking, Need for Session Tracking, Session Tracking API, Encoding URLs Sent to the Client, Accumulating a List of User Data		
3	Listeners and Filters	- Listeners and Filters Using ServletContextListener, - HttpSessionListener, Understanding of all the other Listeners viz. - ServletRequestListener, ServletContextAttributeListener, ServletRequestAttributeListener, HttpSessionAttributeListener - Using Filters for pre and post processing of request.	20	12
4	JSP Programming	JSP Basic Syntax, HTML Text, HTML comments, Template Text, JSP Comment, JSPExpression, JSP Scriptlet, JSP Declaration, JSP Directives, JSP Action, JSP Expression Language Element, Custom Tag (Custom Action), Escaped Template Text, Using JSP Scripting 08 Elements, Using Predefined Variables, XML syntax for Expressions, Scriptlets, Declarations and Directives, Using Scriptlets, Using Declarations, Using Page Directive, Using Standard Actions Tags – , , , Using JavaBeans in JSP pages – , , , Sharing Beans, Use of Scopes and their Attributes	20	12
5	MVC, Tag Library	Integrating Servlets and JSP in a Web Application (MVC Architecture for Web Applications), Implementing MVC with Request Dispatcher, Understanding Data Sharing Between Servlets and JSP,	20	12

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI
Effective from June – 2018

		JSP Expression Language, Accessing Scoped Variables, Bean Properties, Collections and Implicit Objects Using EL, Using EL Operators Tag Library– Basics; Using JSTL – c:out, c:forEach, c:forTokens, c:if, c:choose, c:set, c:remove, c:import, c:url, c:param, c:redirect and c:catch Tags		
Total			100	60

Student Seminar : 05 Lectures
Expert Talk : 05 Lectures
Student Test : 05 Lectures
Total : 75 Lectures

References Books

1. Complete reference J2EE
2. Professional Java Server Programming J2EE 1.3 Edition Apress
Publication
3. Beginning Java J2EE 5 from Novice to Professional Apress
Publication

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BECHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI
Effective from June – 2018

CS-27 Search Engine Techniques and Digital Technology Trends				
Sr. No	Topic	Detail	Weightage In %	Approx. Lectures
1	The Search Engines: Reflecting Consciousness and Connecting Commerce Search Engine Basics	• The Mission of Search Engines • The Market Share of Search Engines • The Human Goals of Searching • Determining Searcher Intent: A Challenge for Both Marketers and Search Engines • How People Search? • How Search Engines Drive Commerce on the Web? • Eye Tracking: How Users Scan Results Pages? • Click Tracking: How Users Click on Results? Natural Versus Paid • Understanding Search Engine Results • Algorithm-Based Ranking Systems: Crawling, Indexing, and Ranking • Determining Searcher Intent and Delivering Relevant • Fresh Content • Analyzing Ranking Factors • Using Advanced Search Techniques • Vertical Search Engines • Country-Specific Search Engines	20	12

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI
Effective from June – 2018

2	Determining SEO Objectives and Defining Site's Audience First Stages of SEO	• Setting SEO Goals and Objectives • Developing an SEO Plan Prior to Site Development • Understanding Audience and Finding Niche • SEO for Raw Traffic • SEO for E-Commerce Sales • SEO for Mindshare/Branding • SEO for Lead Generation and Direct Marketing • SEO for Reputation Management • SEO for Ideological Influence • The Major Elements of Planning • Identifying the Site Development Process and Players • Defining Site's Information Architecture • Auditing an Existing Site to Identify SEO Problems • Identifying Current Server Statistics Software and Gaining Access • Determining Top Competitors • Assessing Historical Progress • Benchmarking Current Indexing Status • Benchmarking Current Rankings • Benchmarking Current Traffic Sources and Volume • Leveraging Business Assets for SEO • Combining Business Assets and Historical Data to Conduct SEO/Website SWOT Analysis	20	12
----------	--	--	-----------	-----------

**BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BECHELOR OF SCIENCE (INFORMATION TECHNOLOGY)**

B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI

Effective from June – 2018

3	Developing an SEO-Friendly Website	• Making Site Accessible to Search Engines • Creating an Optimal Information Architecture • Root Domains, Subdomains, and Microsites • Optimization of Domain Names/URLs • Keyword Targeting • Content Optimization • Duplicate Content Issues Controlling Content with Cookies and Session IDs • Content Delivery and Search Spider Control • Redirects, Content Management System (CMS) Issues • Optimizing Flash • Best Practices for Multilanguage/Country Targeting	20	12
4	Keyword Research, Optimizing for Vertical Search	• The Theory Behind Keyword Research • Traditional Approaches: Domain Expertise • Site Content Analysis • Keyword Research Tools • Determining Keyword Value/Potential ROI, Leveraging the Long Tail of Keyword Demand, Trending, Seasonality, and Seasonal Fluctuations in Keyword Demand • The Opportunities in Vertical Search • Optimizing for Local Search • Optimizing for Image Search • Optimizing for Product Search • Optimizing for News, Blog, and Feed Search • Others: Mobile, Video/Multimedia Search	20	12

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI
Effective from June – 2018

5	Digital Technology Trends	• Digital Business ○ Introduction to digital business, ○ difference between digital business and ecommerce, ○ digital business opportunities, ○ Risk and barriers to digital business adoption • Block Chain Technology ○ Tracing blockchain origin, ○ Blockchain feature, ○ How BlockChain Work? • Virtual Reality, Augmented Reality(AR): ○ Introduction to Virtual Reality (VR), ○ Needs of VR ○ Introduction and brief history of AR ○ Difference between AR and VR ○ opportunities for augmented reality	20	12
Total			100	60

Student Seminar : 05 Lectures
Expert Talk : 05 Lectures
Student Test : 05 Lectures
Total : 75 Lectures

Reference book :

- (1) The Art of SEO : Mastering Search Engine Optimization By Eric Enge, Stephan Spencer, Rand Fishkin, Jessie C Stricchiola, O'Reilly Media, October, 2009
- (2) Web Searching Technology and Search Engine Optimization[ISBN: 978 - 93 - 81786 - 92 - 5] by Bharat & Company
- (3) SEO: Search Engine Optimization Bible, By Jerri L. Ledford, 2nd Edition, Wiley India, April, 2009
- (4) SEO Warrior: Essential Techniques for Increasing Web Visibility By John I Jerkovic, O'Reilly Media, November, 2009

References:

- (5) <http://www.gartner.com/technology/research/digital-business/>
- (6) <https://blockchain.info/>
- (7) Virtual Reality, Steven M. LaValle, University of Illinois, Cambridge University Press. <http://vr.cs.uiuc.edu/>
- (8) Augmented Reality: Ebok <http://libro.eb20.net/Reader/rdr.aspx?b=1073012>
Greg Kipper, Joseph Rampolia, Elsevier Science

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

CS-28 : Practical And Viva Based On CS – 26	
Topics	Marks
CS – 26	100

CS-29 : Practical And Viva Based On CS – 25 and CS-27	
Topics	Marks
CS – 25 and CS - 27	100

Note :

- Practical examination may be arranged before or after theory exam.

CS-30 : Project Viva	Total Marks: 100
Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of previous semester or current semester. <u>(At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode)</u>	

Note :

- Project must be submitted before two week of commencement of theory exam.
- Project viva examination may be arranged before or after theory exam.
- During the project viva examination project must be run.

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BECHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

B. Sc.(IT) Semester - VI

SR.NO	SUBJECT	NO. OF THEORY PER WEEK	NO. OF PRACTICALS PER WEEK
1	CS-31 Mobile Computing using Android	5	-
2	CS-32 Data Warehousing with SQL Server 2012	5	-
3	CS-33 Internet of Things (IOT)	5	-
4	CS-34 PRACTICALS (BASED ON CS-31	-	6
5	CS-35 PRACTICALS (BASED ON CS-32 and CS-33)	-	6
6	CS – 36 Project Development	-	6

Note:

1. Credit of each subject is 5. Total credit of semester is 36.
2. Total marks of each theory paper are 100 (university examination 70 marks + internal examination 30 marks).
3. Total marks of each practical and project-viva paper are 100. No internal examination marks in practical and project-viva papers.

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BECHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

CS-31 Mobile Computing using Android				
Sr. No	Topic	Detail	Weight age In %	Approx . Lectures
1	Introduction to Android Android Application Design	• The Open Handset Alliance • The Android Platform, Android SDK • Building a sample Android application • Anatomy of an Android applications • Android terminologies • Application Context, Activities, Services, Intents • Receiving and Broadcasting Intents • Android Manifest File and its common settings • Using Intent Filter, Permissions • Managing Application resources in a hierarchy • Working with different types of resources	20	12
2	Android User Interface Design	• User Interface Screen elements ○ Button, EditText, TextView, DatePicker, TimePicker, ProgressBar, ListView, GridView, RadioGroup, ImageButton, Fragement • Designing User Interfaces with Layouts ○ Relative Layout, Linear Layout, Table Layout etc • Dialogs • Drawing and Working with Animation ○ Frame By Frame Animation ○ Twined Animation	20	12
3	Database Connectivity Using SQLite and Content Provider	• Using Android Data and Storage APIs • Managing data using SQLite • Sharing Data Between Applications with Content Providers	20	12

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI
Effective from June – 2018

4	Location Based Services (LBS), Common Android API,	• Using Global Positioning Services (GPS) • Geocoding Locations • Mapping Locations • Many more with location based services • Android networking API • Android web API • Android telephony API	20	12
5	Notifications, Services, Deployment of applications	• Notifying the user, Notifying with the status bar • Vibrating the phone • Blinking the lights • Customizing the notifications Services • Application development using JSON in MySQL • Publish android application	20	12
TOTAL			100	60

Student Seminar : 05 Lectures
Expert Talk : 05 Lectures
Student Test : 05 Lectures
Total : 75 Lectures

Notes: Android application must be developed using ANDROID STUDIO.

Reference Books:

- (1) Android Wireless Application Development By Lauren Darcey and Shane Conder, Pearson Education, 2nd ed. (2011)
- (2) Beginning iOS 6 Development By David Mark , Jack Nutting , Jeff LaMarche , Fredrik Olsson Apress Publication.
- (3) Using SQLite By Jay A. Kreibich, Publisher: O'Reilly Media
- (4) Mobile Computing using Android and iPhone [ISBN: 978 - 93 - 81786 - 93 – 2] by Bharat & Company
- (5) Professional Android 2 Application Development Reto Meier, Wiley India Pvt Ltd (2011)
- (6) Beginning Android Mark L Murphy, Wiley India Pvt Ltd

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

CS –32 Data Warehousing with SQL Server 2012				
No.	Topic	Detail	Weightage in %	Min. Lect.
1	Introduction to Data Warehousing	• What Is a Data Warehouse? • Data Warehousing Today • Future Trends in Data Warehousing. • Data Warehouse Architecture • Data Flow Architecture	20	12
2	Designing and Implementation of Data Warehousing	• Logical Design for data warehouse • Physical Design for data warehouse • Design dimension table, fact table for data warehouse • Design and implement effective physical data structure for data warehouse	20	12
3	Creating ETL Solutions with SSIS, Implementing Control Flow in SSIS	• Introduction to ETL with SSIS • Exploring data sources • Implementing data flow using SSIS • Introduction to Control Flow • Creating Dynamic Packages • Using Containers	20	12
4	Enforcing Data Quality, Extending SQL Server Integration Services	• Introduction to Data Quality • Using Data Quality Service to Cleanse data • Using Data Quality Service to match data • Using Scripts in SSIS • Using Custom components in SSIS	20	12
5	Deploying and Configuring	• Overview of SSIS Development	20	12

**BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BECHELOR OF SCIENCE (INFORMATION TECHNOLOGY)**

B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI

Effective from June – 2018

	SSIS Packages, Consuming Data in Data Warehouse	• Deploying SSIS Projects • Planning SSIS Package Execution • Introduction to Business Intelligence • Introduction to Reporting • Introduction to Data Analysis		
			100	60

Student Seminar : 05 Lectures
Expert Talk : 05 Lectures
Student Test : 05 Lectures
Total : 75 Lectures

Notes: For Lab Practice : Microsoft SQL Server 2012 or Higher version

Reference Books:

- (1) Implementing a Data Warehouse with Microsoft® SQL Server® 2012
Dejan Sarka Matija Lah Grega Jerkič
- (2) Building a Data Warehouse: With Examples in SQL Server – Vincent Rainardi-Apress (2014)
- (3) Data mining Explained A manager's guide to customer centric business intelligence by
- (4) Data mining by Pieter Adriaans, Dolf Zantinge
- (5) Data warehousing in the real world A practical guide for business DSS by Sam Anahory,

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BECHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

CS- 33 INTERNET OF THINGS (IOT)				
No	Topics	Details	Weight age in %	Min Lec
1.	IOT AN OVERVIEW	Building an architecture, Main design principles and needed capabilities, An IoT architecture outline, standards considerations. M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management	20	12
2	REFERENCE ARCHITECTURE	IoT Architecture-State of the Art – Introduction, State of the art, Reference Model and architecture, IoT reference Model - IoT Reference Architecture Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views. Real-World Design Constraints- Introduction, Technical Design constraints-hardware is popular again, Data representation and visualization, Interaction and remote control.	20	12
3	IOT DATA LINK LAYER & NETWORK LAYER PROTOCOLS	PHY/MAC Layer(3GPP MTC, IEEE 802.11, IEEE 802.15), Wireless HART, Z-Wave, Bluetooth Low Energy, Zigbee Smart Energy, DASH7 - Network Layer-IPv4, IPv6, 6LoWPAN, 6TiSCH,ND, DHCP, ICMP, RPL, CORPL, CARP	20	12
4	TRANSPORT & SESSION LAYER PROTOCOLS	Transport Layer (TCP, MPTCP, UDP, DCCP, SCTP)-(TLS, DTLS) – Session Layer-HTTP, CoAP, XMPP, AMQP, MQTT	20	12

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

B.Sc.(I.T.)

Syllabus of Semester – V and Semester – VI

Effective from June – 2018

5	SERVICE LAYER PROTOCOLS & SECURITY	Service Layer -oneM2M, ETSI M2M, OMA, BBF – Security in IoT Protocols – MAC 802.15.4 , 6LoWPAN, RPL, Application Layer	20	12
			100	60

Student Seminar : 05 Lectures
Expert Talk : 05 Lectures
Student Test : 05 Lectures
Total : 75 Lectures

References

1. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", 1 st Edition, Academic Press, 2014.
2. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer
3. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-onApproach)", 1 st Edition, VPT, 2014.
4. Bernd Scholz-Reiter, Florian Michahelles, "Architecting the Internet of Things", ISBN 978-3-642-19156-5 e-ISBN 978-3-642-19157-2, Springer.
5. Francis daCosta, "Rethinking the Internet of Things: A Scalable Approach to Connecting Everything", 1st Edition, Apress Publications, 2013
6. Peter Waher, "Learning Internet of Things", PACKT publishing, BIRMINGHAM – MUMBAI
7. http://www.cse.wustl.edu/~jain/cse570-15/ftp/iot_prot/index.html

BHAKTA KAVI NARSINH MEHTA UNIVERISTY
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)
B.Sc.(I.T.)
Syllabus of Semester – V and Semester – VI
Effective from June – 2018

CS-34 : Practical And Viva Based On CS – 31	
Topics	Marks
CS – 31	100

CS-35 : Practical And Viva Based On CS – 32 and CS-33	
Topics	Marks
CS – 32 and CS – 33	100

Note :

- Practical examination may be arranged before or after theory exam.

CS-36: Project Viva	Total Marks: 100
Project must be developed in the computer laboratory of concern institute under the supervision of faculties of concern institute on any subject of semester-V or semester-VI. <u>(At the time of Project-Viva examination student must show all the Workouts, SDLC, Documentation, Program codes and project in running mode)</u>	

Note :

- Project must be submitted before two week of commencement of theory exam.
- Project viva examination may be arranged before or after theory exam.
- During the project viva examination project must be run.