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VEER NARMAD SOUTH GUJARAT UNIVERSITY
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વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
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ક્રમાંક : એકે./પરિપત્ર/૭૦૧૪ /૨૦૨૧
તા.૨૮/૦૫/૨૦૨૧

પ્રતિ,
વડાશ્રી,
જે.પી.દાવર ઈન્સ્ટીટયૂટ ઓફ ઈન્ફોર્મેશન
સાયન્સ એન્ડ ટેકનોલોજી,
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી,
સુરત.

વિષય :– એમ.એસસી (આઈ.ટી) સેમેસ્ટર–૧ અને ૨ ના અભ્યાસક્રમ બાબત.

સુજ્ઞશ્રી,

સવિનય જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૧–૨૦૨૨ થી એમ.એસસી. (આઈ.ટી.) પ્રથમ વર્ષ સેમેસ્ટર –૧ અને ૨ નો અભ્યાસક્રમ અંગે ઈન્ફોરમેશન ટેકનોલોજીની વિષયની એડહોક (નિયૂકત) સમિતિની તા.૨૨/૦૧/૨૦૨૧ની સભામાં નીમેલ પેટાસમિતિએ તૈયાર કરેલ અભ્યાસક્રમ કોમ્પ્યુટર સાયન્સ અભ્યાસસમિતિ તથા કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાની તા.૧૦/૦૫/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંકઃ૩ અન્વયે નીચે મુજબ મંજૂર કરી એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલે તેની તા. ૨૧/૦૫/૨૦૨૧ ની સભાના ઠરાવ ક્રમાંક : ૦૩ અન્વયે મંજૂર કરેલ છે. તેની જાણ સંબંધકર્તા શિક્ષકો અને વિદ્યાર્થીઓને કરવી, તદ્ઉપરાંત તેનો અમલ કરવો.

કોમ્પ્યુટર સાયન્સ વિષયની અભ્યાસસમિતિ તથા કોમ્પ્યુટર સાયન્સ વિદ્યાશાખાની તા.૧૦/૦૫/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંકઃ ૩

:: આથી ઠરાવવામાં આવે છે કે, એમ.એસ.સી.(આઈ.ટી./આઈ.સી.ટી.)ના એડહોક બોર્ડ દ્વારા મંજૂર થયેલા એમ.એસ.સી.(આઈ.ટી.) પ્રથમ વર્ષના અભ્યાસક્રમ મંજૂર કરી એકેડેમિક કાઉન્સિલને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૨૧/૦૫/૨૦૨૧ ની સભાનાં ઠરાવ ક્રમાંકઃ ૦૩

:: આથી ઠરાવવામાં આવે છે કે, કોમ્પ્યુટર સાયન્સ વિષયની અભ્યાસસમિતિ તથા કોમ્પ્યુટર સાયન્સ વિદ્યાશાખાની તા.૧૦/૦૫/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંકઃ ૩ અન્વયે સ્વીકારેલ એમ.એસ.સી. (આઈ.ટી.) પ્રથમ વર્ષના અભ્યાસક્રમ મંજૂર કરવામાં આવે છે.

બિડાણ : ઉપર મુજબ

ઈ.ચા.કુલસચિવ

પ્રતિ,
૧) અધ્યક્ષશ્રી, કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખા
૨) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

...તરફ જાણ તેમજ ઘટતી કાર્યવાહી સારૂ.

Course : 103 : Fundamentals of Computer

Course Code	103
Course Title	Fundamentals of Computer
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2021
Purpose of Course	This course helps students to understand basics of computer and office tools
Course Objective	The students would be able to understand the basic uses and applications of computer, to know different components of computer, to get familiar with various computer codes, basics of operating system, configuration and maintenance of open source operating system, its commands. The student would also learn open source office tools.
Pre-requisite	NIL
Course Out come	Students will be able to understand better use of computer and its operations.
Course Content	**Unit : 1 : Introduction to Computers and its components** 1.1 Computer 1.1.1. Introduction to Computer 1.1.2. The Components of Computer 1.1.3. Advantages and Disadvantages of Computer 1.1.4. Generations of Computer 1.1.5. Computer Software 1.1.6. Categories of Computers 1.1.6.1 Personal Computers 1.1.6.2 Mobile Computers 1.1.6.3 Servers 1.1.6.4 Mainframes 1.1.6.5 Super Computers 1.1.6.6 ATM 1.1.6.7 POS 1.1.7. Usage and Applications of Computer in Society 1.2. Components of Computer 1.2.1 Block Diagram of Computer 1.2.2 The System Unit 1.2.3 Processor 1.2.4 Motherboard 1.2.5 Memory - Register, RAM, ROM 1.2.6 Expansion Slots and Adaptor Cards 1.2.7 Ports and Connectors 1.2.8 Buses 1.2.9 Power Supply 1.2.10 Input Output Systems 1.2.11 Storage Systems 1.2.12 BIOS 1.2.13 Interrupt 1.2.14 Device Driver **Unit : 2 : Computer Codes and Conversions** 2.1 Computer Codes 2.1.1 Introduction to Computer Codes 2.1.2 Decimal System 2.1.3 Binary System

	2.1.4 Hexadecimal System 2.1.5 Octal System 2.1.6 4-bit BCD System 2.1.7 8-bit BCD System 2.1.8 ASCII code 2.1.9 16-bit Unicode 2.2 Conversion of Numbers (from one Number System to another - includes fixed and fractional numbers) **Unit : 3 : Operating System and Usage** 3.1 Types of OS 3.1.1 Single User 3.1.2 Multi - User 3.1.3 Uni - Processor 3.1.4 Multi - Processor 3.1.5 Batch Processing 3.1.6 Time - Sharing 3.1.7 Real Time 3.2 Booting Process of Computer 3.7 Need of OS 3.6 Functions of OS 3.3 Types of File System - FAT, NTFS, APFS, EXT 3.4 Partition of Disk 3.5 Installation of OS **Unit : 4 : Introduction to Open Source OS : Linux** 4.1 Features and Components of Linux 4.2 Components of Linux 4.3 Installation and Configuration of Open Source Software 4.3 Basic Commands – cat, cmp, diff, wc, sort, mkdir, rmdir, cd, ls, cp, mv, pwd, passwd, who, whoami, chmod, date, more, sudo, apt-get, install, update, upgrade. **Unit : 5 : Open Office** 5.1 Open Office – Writer 5.1.1 Working with Documents 5.1.2 Formatting Documents 5.1.3 Setting Page style 5.1.4 Creating Tables 5.1.5 Drawing- Tools 5.1.6 Printing Documents 5.2 Open Office – Calc 5.2.1 Introduction to Spreadsheets 5.2.2 Overview of a Worksheet 5.2.3 Creating Worksheet & Workbooks 5.2.4 Organizing files, Managing files & workbooks 5.2.5 Functions & Formulas 5.2.6 Working with Multiple sheets 5.2.7 Creating Charts & Printing Charts 5.3 Open Office – Impress 5.3.1 Creating Presentation, Saving Presentation Files 5.3.2 Master Templates & Re-usability 5.3.3 Slide Transition 5.3.4 Making Presentation CDs

	5.3.5 Printing Handouts
Reference Book	1. Fundamentals of Computer : E Balagurusamy - McGraw-Hill 2. Computer Fundamentals : P.K. Sinha - BPB Publications 3. OpenOffice.org for Dummies : Gurdy Leete - Wiley-India 4. Computer Fundamentals : Anita Goel - Pearson 5. Fundamentals of Computer : Rajaraman V. - PHI 6. Fundamentals of Computers : Reema Thareja - Oxford University Press
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	30% Internal assessment 70% External assessment

Course : 104 : Fundamentals of Programming Using C-I

Course Code	104
Course Title	Fundamental of Programming using C-I
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2021
Purpose of Course	To provide fundamental knowledge of programming using C language.
Course Objective	To make students aware of problem solving methodology to solve problems and design solutions.
Pre-requisite	NIL
Course Out come	Students will be able to solve problems, to write algorithms of solutions and translate solutions into programs.
Course Content	**Unit : 1 : Phases of Problem Solving Methodology** 1.1 Problem Analysis Gathering available data, Identifying relevant facts, Defining the problem, Generating alternative methods of solution, Selecting the optimum approach 1.2 Problem solving techniques Simplification, Divide and conquer: break down a large, complex problem into smaller solvable problems, Constraint examination 1.3 Algorithm 1.4 Flowchart **Unit : 2 : Introduction to Computer Programming** 2.1 Introduction to Computer Programming Language and Program 2.2 Programming languages and Levels 2.3 Language Translators 2.3.1 Compiler 2.3.2 Interpreter 2.3.3 Assembler 2.4 Program Verification 2.4.1 Program Correctness 2.4.2 Program Bugs & Testing **Unit : 3 : Introduction to C language** 3.1 Overview of C 3.2 Constants, Variables and Data types 3.3 Operators and expressions 3.4 Simple Assignment statement 3.5 Basic Input/Output Statements 3.6 Decision Making Statements 3.7 Looping 3.8 Nested Control Structures **Unit : 4 : Array** 4.1 One dimensional Array 4.2 Declaration & Initialization of Array 4.3 Two dimensional array 4.3.1 Declaration 4.3.2 Accessing Matrix Elements 4.3.3 Operations on matrix elements and entire matrices 4.4 Array manipulation 4.4.1 Searching 4.4.2 Insertion

	4.4.3 Deletion 4.4.4 Modification 4.4.5 Sorting 4. 5 Multidimensional Array **Unit : 5 : Character Array & String** 5.1 Declaration & Initialization of String 5.2 Input/Output functions for String 5.3 Arithmetic operations on String 5.4 In built Functions for handling String 5.5 Array of String
Reference Book	1. Programming in ANSI C : E. Balagurusamy - Tata McGraw Hill 2. Let us C : Yashwant Kanetkar - BPB Publications 3. Programming with C : R S Bichkar - Universities Press 4. The complete Reference C : Herbert Schildt - McGrawHill 5. Schaums outline of Theory and Problems of programming with C : Byron Gottfried - McGrawHill 6. C Programming Language : Karnighan & Ritchie - TMH
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	30% Internal assessment 70% External assessment

Course : 105 : Internet and Web Technology

Course Code	105
Course Title	Internet and Web Technology
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2021
Purpose of Course	To Provide basic knowledge about Internet and Web Designing.
Course Objective	To make the students aware of Internet and website designing using HTML, CSS and CSS Framework
Pre-requisite	NIL
Course Out come	Students will be able to understand the basics of Internet and develop static websites
Course Content	**Unit : 1 : Introduction to Internet** 1.1 History of Internet 1.2 Working of Internet 1.3 Internet Applications 1.4 Advantages of Internet 1.5 WWW 1.6 Uniform Resource Locator 1.7 W3C Standards 1.8 Web Pages 1.9 Web Server 1.10 Web Browsers 1.11 Domain Name Service 1.12 Applications of Internet 1.13 Internet Service Providers 1.14 DSL, Broadband and ISDN 1.15 Dedicated Connections 1.16 Wireless Connections 1.17 IP Addresses - IPv4 and IPv6 1.18 DHCP 1.19 Static IP and Dynamic IP **Unit : 2 : HTML** 2.1 Structure 2.2 Open Source HTML Editors 2.3 Links 2.4 Images and ImageMaps 2.5 Tables 2.6 Forms 2.7 Frames **Unit : 3 : Advanced HTML** 3.1 Semantic Elements and Non-Semantic Elements 3.2 HTML5 Elements 3.3 HTML5 Input Types and Attributes 3.4 Graphics - Canvas and SVG 3.5 Media - audio, embed, source, track and video **Unit : 4 : Advanced Cascading Style Sheet (CSS)** 4.1 Style Sheet Types 4.1.1 Linked 4.1.2 Embedded

	4.1.3 Inline 4.2 Style Sheet Precedence 4.3 Style Sheet Syntax 4.4 Using Classes 4.5 Font Control 4.6 Text Control 4.7 Color and Background 4.8 List Box Control 4.9 Miscellaneous Properties 4.9.1 Margin and Padding Properties 4.9.2 Border Properties 4.9.3 Tables 4.10 Multi-Column Layouts 4.11 Gradients 4.12 Drop Shadows 4.13 2D Transforms 4.13.1 Translate 4.13.2 rotate 4.13.3 scale 4.13.4 skew 4.14 3D Transforms 4.15 Transitions 4.16 Animations 4.17 Paged Media 4.18 Using Ready made Templates 4.19 Bootstrap framework 4.19.1 Introduction to Responsive Design, Using Bootstrap in a Web page 4.19.2 Typography, Color management, Jumbotron, Images, Alerts, Buttons 4.19.3 Tables,Forms, Drop downs, Navigation bar, Grid Basics, Pagination 4.19.4 Testing responsiveness using Browser Developer Tools **Unit : 5 : Web Designing Fundamentals** 5.1 Role and Tasks of a Web Designer 5.2 Characteristics of User Friendly Websites with Improved UI/UX 5.3 Basic Search Engine Optimization (SEO) Techniques 5.4 Case Study
Reference Book	1. How the Internet Works : Preston Gralla - Que PUB. 2. HTML 5.0 Black Book : Kogent - Dreamtech Press 3. HTML & CSS: The Complete Reference : Thomas - TMH 4. The Book of CSS3 - A Developer's Guide to the Future of Web Design : Peter Gasston - No Starch Press 5. The Internet : K.L. James - PHI 6. Internet Technology and Web Design : ISRD Group - TMH 7. Bootstrap: Jake Spurlock - O'Relly 8. Search Engine Optimization: Harold Davis - O'Relly
Teaching Methodology	Lectures, Discussion, Independent Study, Seminars and Assignment
Evaluation Method	30% Internal assessment 70% External assessment

Course : 106 : Practical 1

Course Code	106
Course Title	Practical 1
Credit	3
Teaching Per Week	6 Hrs
Minimum Weeks Per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)
Last Review/Revision	June 2021
Purpose of Course	To impart practical knowledge of programming
Course Objective	To give practical knowledge of C programming
Prerequisite	Nil
Course Outcome	Students will be able to solve problems using C language
Course Content	Practical based on Paper No. 104 - Fundamentals of Programming using C-I
Reference Books	NIL
Teaching Methodology	Lab Work
Evaluation Method	30% Internal Assessment 70% External Assessment

Course : 107 : Practical 2

Course Code	107
Course Title	Practical 2
Credit	2
Teaching Per Week	4 Hrs
Minimum Weeks Per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)
Last Review/Revision	June 2021
Purpose of Course	To impart practical knowledge of static website development
Course Objective	To give practical knowledge of HTML
Prerequisite	Nil
Course Outcome	Students will be able to develop static website using HTML
Course Content	Practical based on 105 - Internet and Web Technology
Reference Books	NIL
Teaching Methodology	Lab Work
Evaluation Method	30% Internal Assessment 70% External Assessment

Course: 203 : Fundamentals of Programming using C - II

Course Code	203
Course Title	Fundamentals of Programming using C - II
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2021
Purpose of Course	To teach advance concepts of C language
Course Objective	To develop better understanding of advanced features of C programming language.
Pre-requisite	Basic knowledge of problem solving and C programming.
Course Outcome	Students will be able to write programs using advanced programming concepts using C language.
Course Content	**Unit : 1 : Structure and Union** 1.1 Structure 1.1.1 Declaring and Defining Structure elements 1.1.2 Structure Initialization 1.1.3 Structure assignment 1.1.4 Array of Structure, Array within a structure 1.1.5 Nested Structure 1.1.6 Size of Structure 1.2 Union **Unit : 2 : User Defined Functions** 2.1 Introduction 2.2 Declaration and Definition 2.3 Methods of parameter passing 2.4 Scope of variables and storage classes 2.5 Recursion 2.6 Passing array to functions 2.7 Passing Structure, union to function **Unit : 3 : Pointer** 3.1 Pointer Basics 3.2 Pointers and arrays 3.3 Chain of pointers 3.4 Pointer and character strings 3.5 Array of pointers, pointer to array 3.6 Pointer and functions 3.6.1 Call by value & call by reference 3.6.2 Passing array to a function using pointer 3.7 Pointer to structures 3.8 Issues with pointers 3.9 Dynamic memory allocation 3.9.1 Allocating a memory block 3.9.2 Allocating multiple blocks of memory 3.9.3 Altering the size of a block 3.9.4 Releasing used Space **Unit : 4 : File Management in C** 4.1 Introduction : Definition, File structure, concept of Record 4.2 File access modes: Sequential, random, binary, 4.3 File Operations 4.2.1 Creating a new file 4.2.2 Opening a file 4.2.3 Reading from a file 4.2.4 Writing to a file

	4.2.5 Moving to a specific location in a file (Seek) 4.2.6 Closing a file 4.4 Error handling during I/O operations 4.5 Command Line Arguments **Unit : 5 : The Pre-processor** 5.1 Features of C Preprocessor 5.2 Macro 5.3.1 Macro Expansion 5.3.2 Macro with arguments 5.3.3 Nested Macro 5.3 File Inclusion 5.4 Conditional compilation 5.5 Compiler Control Directives
Reference Book	1 Programming in ANSI C : E. Balagurusamy - Tata McGraw Hill 2 Let us C : Yashwant Kanetkar - BPB Publications 3 Pointers in C : Yashwant Kanetkar - BPB 4 The complete Reference C : Herbert Schildt - McGrawHill 5 Programming with C : R S Bichkar - Universities Press 6 C Programming Language : Karnighan & Ritchie - TMH 7 Mastering Turbo C : Stan Kelly - BPB
Teaching Methodology	Discussion, Independent Study, Seminars and Assignment
Evaluation Method	30% Internal assessment 70% External assessment

Course : 204 : E Business and Cyber Laws

Course Code	204
Course Title	E Business and Cyber Laws
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	March 2021
Purpose of Course	To provide fundamental knowledge of E Business and Cyber Laws
Course Objective	To Impart fundamental Knowledge of E Business and Cyber Laws
Pre-requisite	Knowledge of Fundamental of Computers, Computer Networks
Course Out come	Students will be able to understand E Business , Cryptocurrency, Blockchain, Cyber Security and Cyber Laws
Course Content	**Unit 1 : E Commerce** 1.1 E Business 1.2 E Business Models 1.3 The Technologies and Infrastructural requirements of E-Commerce 1.4 Advantages and Disadvantages of E-Commerce 1.5 International issues of Electronic Commerce 1.6 Types of business transactions (B2B), (B2C), (B2G),Business Processes 1.7 Digital India Services, DigiLocker and other tools **Unit 2 : Introduction to E Payments** 2.1 Digital payments requirements 2.2 Digital Token based E payment systems 2.3 Classification of new payment system 2.4 E Wallet 2.5 Online Internet Banking 2.6 Unified payment Interface – BHIM and other tools 2.7 Online financial services in India **Unit 3 : Cryptocurrency ,Bitcoin and Blockchain** 3.1 Introduction to Crytocurrency 3.2 How Cryptocurrency Works , Ewallet Services and Personal Cryptosecurity 3.3 Introduction to Bitcoin , Merchants acceptance of Bitcoin 3.4 How Bitcoin Works overview, Transaction ,Blocks , Mining 3.5 Blockchain – Technology Stack :Protocol, Currency 3.6 Financial Services 3.7 Crowd Funding 3.8 Bitcoin Prediction Markets, 3.9 Smart Property 3.10 Smart Contracts 3.11 Decentralized Governance Services. 3.12 The Blockchain is an Information Technology **Unit 4 : Cyber Security** 4.1 Introduction 4.2 Network and website Security Risks 4.3 Hacking 4.4 Privacy Risk 4.5 Cyber Defamation 4.6 Identity Theft & Fraud

	4.7 Digital Forgery 4.8 Cyber terrorism 4.9 Cyber Pornography 4.10 Digital Forgery 4.11 Digital Signature 4.12 E- business Risk management issues 4.13 Firewall, Security framework **Unit 5 : Cyber Laws** 5.1 Cyber Crimes against Individuals, Institution and State 5.2 Computer and mobile as target for crime 5.3 Introduction to Cyber Laws 5.4 Limitation of India's Cyber Laws 5.5 Types of Civil Wrongs under the IT Act, 2000 5.6 Punishments under the IT Act 5.7 Intellectual Property Rights
Reference Book	1. E-Commerce An Indian Perspective P.T. Joseph ,S. J. - PHI publication 2. IT Encyclopedia.Com : Parag Diwan & Sunil Sharma - E-commerce - Pentagon Press. 3. E-Commerce Strategies : Charles Trepper – PHI 4. Information Technology Act : S. R. Bhansali - University Book House Pvt. Ltd. 5. Cyber Crimes and Law Enforcement : Vasu Deva - Commonwealth Publishers 6. Decentralized Applications , Harnessing Bitcoin's Blockchain Technology: Siraj Raval – O'Reilly 7. Blockchain, Blueprint for a new Economy : Melanie Swan – O'Reilly 8. Mastering Bitcoin, Programming the open Blockchain : Andreas M. Antonopoulos – O'Reilly 9. Essential CyberSecurity Science : Josiah Dykstra – O'Reilly
Teaching Methodology	Class Room Teaching, Discussion and Assignment
Evaluation Method	30% Internal assessment 70% External assessment

Course : 205 : Introduction to DBMS

Course Code	205
Course Title	Introduction to DBMS
Credit	4
Teaching per Week	4 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2021
Purpose of Course	To introduce the basic concepts of database management system that includes data models, database design and basic practical of open source DBMS.
Course Objective	To teach fundamental concepts of DBMS including data models, ER diagram, different types of databases. This course also entails practical aspect of open source database.
Pre-requisite	Fundamentals of Computer, Programming Language
Course Out come	Students will be able to understand and implement basic database design principles, learn overview of different types of database. Students will also be able to perform practical on database through source database.
Course Content	**Unit : 1 : Basic Concepts of DBMS** 1.1 File Organization and Traditional File based System 1.2 Database and Need for DBMS 1.3 Characteristics of DBMS 1.4 Applications of DBMS 1.5 Views of Data - Schema and instances 1.6 Data Independence 1.7 Database Languages 1.8 Transaction Management 1.9 ACID Properties of Transaction 1.10 Database Administrator and Database Users 1.11 Overall System Architecture **Unit : 2 : Data Models** 2.1 Data Models 2.1.1 Network Model 2.1.2 Hierarchical Model 2.1.3 Relational Model 2.1.4 Object Model 2.1.5 Object-Relational Model 2.2 Entity Relationship Model 2.2.1 DB Design using ER Model 2.2.2 Entities 2.2.3 Relationships 2.2.4 Attributes 2.2.5 Entities and Relationship Set 2.2.6 Constraints and Design Issues 2.2.7 Weak Entity Set 2.2.8 Cardinality Ratio **Unit : 3 : Types of Databases and Recent Trends in DBMS** 3.1 Types of Databases 3.1.1 Object Oriented Database 3.1.2 Centralized Database

	3.1.3 Distributed Database 3.1.4 Parallel Database 3.1.5 Multimedia Database 3.1.6 NoSQL Database 3.1.7 Temporal Database 3.1.8 XML Database 3.2 Recent Trends in DBMS 3.2.1 Overview of Various Databases - MySQL, PostgreSQL, SQLite, MongoDB, MariaDB, Oracle, DB2and SQL Server 3.3 Big Data **Unit : 4 : Introduction to Open Source Database - MySQL** 4.1 Getting Started with MySQL 4.2 Installing MySQL 4.3 Data Types 4.4 Creating and Using Database 4.5 DDL Statements 4.5.1 Create Table 4.5.1.1 Constraints 4.5.1.2 Primary Key and Foreign Key Constraint 4.5.2 Alter Table 4.5.3 Delete Table **Unit : 5 : DML Statements and Other Functions of MySQL** 5.1 DML Statements 5.1.1 Insert Statement 5.1.2 SQL 5.1.3 Select Statement 5.1.4 Update Statement 5.1.5 Delete Statement 5.2 Aggregate Functions 5.3 Numerical Functions 5.4 String and Character Functions
Reference Book	1. Database System Concepts : Silberschatz, Korth and Sudarshan - McGraw Hill 2. An introduction to database systems : C. J. Date - Addison Welsley 3. Fundamentals of Database Systems : Elamsri, Navathe, Somayajulu and Gupta - Pearson Education 4. PHP and MySQL Web Development (Developer's Library) : Luke Welling - Addison - Wesley Professional 5. The Compete Reference MySQL : Vikram Vaswani - McGraw Hill 6. Murach's MySQL : Joel Murach - Mike Murach & Associates, Inc.
Teaching Methodology	Lectures, Discussion, Independent Study, Seminars, Case Study and Assignment
Evaluation Method	30% Internal assessment 70% External assessment

Course : 206 : Practical 3

Course Code	206
Course Title	Practical 3
Credit	3
Teaching Per Week	6 Hrs
Minimum Weeks Per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)
Last Review/Revision	June 2021
Purpose of Course	To impart practical knowledge of advance features of programming
Course Objective	To give practical knowledge of advance C programming
Prerequisite	Basic knowledge of C programming language
Course Outcome	Students will be able to solve problems using advance features of C language
Course Content	Practical based on Paper No 203 - Fundamentals of Programming using C-II
Reference Books	NIL
Teaching Methodology	Lab Work
Evaluation Method	30% Internal Assessment 70% External Assessment

Course : 207 : Practical 4

Course Code	207
Course Title	Practical 4
Credit	2
Teaching Per Week	4 Hrs
Minimum Weeks Per Semester	15 (Including Practical Work, Examination, Preparation, Holidays etc.)
Review/Revision	June 2021
Purpose of Course	The course provides practical knowledge of open source database – MySQL.
Course Objective	The course prepares students to execute basic database statements using MySQL.
Prerequisite	Basic Programming Concepts
Course Outcome	After completion of this course, students will be able to perform basic DDL, DML commands including SQL queries using MySQL.
Course Content	Practical based on Paper No. 205 - Introduction to DBMS
Reference Books	NIL
Teaching Methodology	Lab Work
Evaluation Method	30% Internal Assessment 70% External Assessment

Master of Science (Information Technology)

Name of Program	Master of Science (Information Technology)
Abbreviation	M.Sc. (I.T.)
Duration	5 Years Integrated Course B.Sc.(I. T.) – 3 years – Semester 1 to 6 M.Sc.(I. T.) – 2 years – Semester 7 to 10
Eligibility	H S C / Equivalent Examination from Science Stream (A / B / AB Group) or Vocational Stream or General Stream (Commerce) with English as one of the subject.
Objective of Program	The objective of the program is to transform students into professionals by indoctrinating advanced technical knowledge, enhancing technical skills, communication skills and provide outstanding placement in reputed I.T. companies.
Program Outcome	After the completion of the course, students will be able to develop and manage various types of software based on technologies learnt throughout the course and emerging technologies in IT industry which will give them excellent career prospects.
Effective From	June 2021

Program Structure		**B.Sc. (I.T.) – Semester 1 (M.Sc. (I.T.) 5 years Integrated Course)**						
Course Code	Title	Teaching per week (Hrs.)		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
101	Communication Skills in English	4	0	4	3 Hrs	70	30	100
102	Mathematics – I	4	0	4	3 Hrs	70	30	100
103	Fundamentals of Computer	4	0	4	3 Hrs	70	30	100
104	Fundamentals of Programming using C- I	4	0	4	3 Hrs	70	30	100
105	Internet and Web Technologies	4	0	4	3 Hrs	70	30	100
106	Practical 1	0	6	3	2 Hrs	70	30	100
107	Practical 2	0	4	2	2 Hrs	70	30	100
108	NSS/Sports/Saptdhara	-	-	2	-	-	-	-
	Total	20	10	27	-	490	210	700

Program Structure		**B.Sc. (I.T.) – Semester 2 (M.Sc. (I.T.) 5 years Integrated Course)**						
Course Code	Title	Teaching per week (Hrs.)		Course Credits	University Examination		Internal Marks	Total Marks
		Theory	Practical		Duration	Marks		
201	Business Communication Skills in English	4	0	4	3 Hrs	70	30	100
202	Mathematics- II	4	0	4	3 Hrs	70	30	100
203	Fundamentals of Programming using C- II	4	0	4	3 Hrs	70	30	100
204	E Business and Cyber Laws	4	0	4	3 Hrs	70	30	100
205	Introduction to DBMS	4	0	4	3 Hrs	70	30	100
206	Practical 3	0	6	3	2 Hrs	70	30	100
207	Practical 4	0	4	2	2 Hrs	70	30	100
208	NSS/Sports/Saptdhara	-	-	2	-	-	-	-
	Total	20	10	27	-	490	210	700

Program Passing Rules	**As per University rules**