

**Veer Narmad South Gujarat University
Surat**

**Master of Information Technology
[Five Year Integrated Course]**

Semester : 3 & 4

**Revised Syllabus
(Based on CBCS)**

Effective from June 2012-2013

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester III

Teaching and Evaluation Scheme

Course Code	Course Type	Course Name	External Marks	Internal Marks	Contact Hours	Credits
301	FOUNDATION COURSE	Business Systems	70	30	2	2
302	CORE ELECTIVE	Digital Electronics	70	30	3	3
303	CORE	Data Structures	70	30	4	4
304	CORE	Object Oriented Programming	70	30	4	4
305	CORE	Computer Network	70	30	4	4
306	CORE	Practical	140	60	12	6
307	FOUNDATION ELECTIVE	NSS/Sports/Saptdhara	-	-	2	2
		TOTAL	490	210	31	25

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester III

Paper No : 301

L: 2 Hrs

Paper Title: Business Systems

Credit: 2

1. Human Resources

Organizational Management, Personnel Administration, Recruitment, Personnel Development, Time Management, Training and Event Management, Human Capital Management.

2. Services Oriented Business System

Service Definition, Types of Services, Process of Services, Effects of Services, Software as a Service

3. Payroll System

4. Business Logistics System

Introduction to Logistics, Logistics Process, Procurement, Logistics And Supply Chain Management, Warehouse Management, Freight Transport, Material Management

5. Retailing

Introduction to Retailing, Customer Relationship Management in Retailing, Merchandising and Inventory Management in Retailing

6. Production Planning

Production process, Capacity Planning, Master Production, Scheduling, Material Requirements Planning, Shop Floor

7. Introduction to ERP

Evolution of ERP, Definition of ERP, Reasons for the growth of ERP, scenario And Justification of ERP in India, Various Modules of ERP, Advantage of ERP.

Explanation of the above systems must be supported with the help of related documents, visuals of the systems, case studies and demonstration of computerized systems.

Main Readings :

1. Human Resource Development: P.C. Tripathi - Sage Publication, New Delhi.
2. Human Resource And Personnel Management: K.Aswathappa - TMH
3. Services Marketing People, Technology, Strategy: Chrestopper Lovelock and Jochen Wirtz - Pearson Education.
4. Production And Operations Management: K. Aswathappa And Shreddhara Bhat, Himalaya Publishing House.
5. Retailing Management: Levy writz - TMH.
6. Logistics And Distributed Management: Alan Rushton, John Oxley Phil Croucher - Kogan Page.
7. Retailing Management: Swapna Pradhan - TMH

Supplementary Readings :

1. Designing & Monitoring HRD System: Dr. T. V. Rao.
2. Logistics And Retail Management: John Fernie And Leigh Sparks - Kogan Page.
3. Excellence in Warehouse Management: Stuart Emmett - John Wiley And Sons Inc.

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester III

Paper No : 302

L: 3 Hrs

Paper Title: Digital Electronics

Credit: 3

1. Logic gates

Logic symbol, Timing Diagrams, Truth table Demorgan's first & second theorem. Interchangeability bubbled gates, Universal gates

2. Boolean Laws & theorem

Duality theorem sum of product method & equation truth table, Karnaugh map for two three & four variables & it's simplification & NAND-NAND ckts, Don't care condition , product of sum method , & it's simplification . NOR - NOR ckts. & application of duality theorem.

3. Data processing circuits

Multiplexers, Nibble multiplexers, Demultiplexers decoders chip expansion, BCD to Decimal decoders, decoder driver IC's Encoders , decimal to BCD decoder, parity generator & checkers & its application (ROM, PROM, EPROM)

4. Binary addition & subtraction HALF adder, full adder , adder - subtracter circuits

5. FLIP FLOPS

Construction of flip flops using different gates , RS flip flops , D flip flop , Edge triggered D flip flop, clocked RS flip flop ,switching time , JK flip flop , JK master slave flip flop , Schmitt trigger.

6. Shift Registers and counters

Types of Registers , Serial in Serial out , Serial in Parallel out , Parallel in Serial out , Parallel in Parallel out, Ring counter, Asynchronous counter 4, Binary up-down counter , Decoding gate , Synchronous counter , Mode 8 Parallel binary counter & up down counter , Parallel up down counter , Mod-3 counter , Mod-6 counters, Mod - 5 counters & Decade counter, Shift counters.

Main Readings:

1. Digital Principles and Application : Albert Paul, Malvino , Donald P. Leach - TMH
2. Basic Electronics, Solid state: B.L. Thereja , Chand Publication, fifth edition.

Supplementary Readings:

1. Digital logic and Computer Design : By M. Morris Mano - PHI

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester III

Paper No : 303

L: 4 Hrs

Paper Title: Data Structures

Credit: 4

1. Introduction:

Data structure: Definition & classification, Importance of Data Structure
Data Structure Operations
Analysis of algorithms, Algorithms Complexity, Time-Space Trade off
Big oh and theta notation

2. Linear Data structures with applications:

Array: Storage, mapping, applications

Stack: Definition and Example, Implementation, Applications: Infix, Prefix and postfix,
Converting infix to postfix, Expression Evaluation, Matching parentheses, Recursion and
Simulating Recursion, Tower of Hanoi Problem

Queue: Introduction, Types of queue: simple queue, circular queue, deque, priority queue,
implementation, Applications: Job Scheduling

Linked List, List Types: singly, doubly, singly circular, doubly circular
Operations on all types of Lists, Dynamic implementation of stack and queues
Applications: Polynomial Manipulation

3. Non Linear data structures:

Tree: Introduction and representation, Forest, Tree traversal, Binary Tree representation
using array and links, Binary tree traversal (recursive & non-recursive implementation)

Applications of Trees - The manipulation of Arithmetic expressions, Expression tree,
Symbol-table construction, Syntax Analysis

Binary search tree, Heap tree, AVL tree, Splay tree

4. Searching and Sorting:

Linear Search, Binary Search

Hash Tables: Introduction, hash functions and hash keys, Collisions, Resolving collisions,
Rehashing

Sorting with algorithm analysis (best case, worst case, average): Bubble, Selection,
Insertion, Shell, Merge, Quick, Heap, Radix

5. File Structure:

Physical storage media, File Organization, Organization records into blocks, Sequential blocks, Indexing (primary, secondary, clustered, unclustered, dense, sparse)

B+ tree Index files, B tree index files, B* Tree

Hashing function and its characteristics, collision resolution, linear probing, chaining with and without replacement, rehashing

Main Readings:

1. An Introduction to Data Structures with applications – Trembley, Sorenson – TMH
2. Theory and problems of data structures – Seymour Lipschutz – TMH
3. Data Structures and Algorithms in C++ - Michael T. Goodrich, Roberto Tamassai, David M. Mount - Wiley

Supplementary Readings:

1. Fundamentals of Data Structures in C, Horowitz, Sahni, Anderson-Freed - W. H. Freeman & Co. New York, NY, USA
2. Data Structures: A Pseudo-code Approach with C, Gilberg & Forouzan -Thomson Learning.
3. Design and Analysis of Algorithms, Parag Dave & Himanshu Dave - Pearson Education (2008)
4. Data Structures Using C & C++, Tanenbaum - PHI.
5. Data Structures & Algorithms, A V Aho, J E Hopcroft, J D Ullman - Addison-Wesley Publishing (1983).
6. Sorting & Searching - The Art of Computer Programming, Vol. 3, D E Knuth- Addison-Wesley Publishing (1973).

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester III

Paper No : 304

L: 4 Hrs

Paper Title: Object Oriented Programming

Credit: 4

1. Pointers and Self Referential Structures

2. Principles of Object Oriented Programming

Procedure Oriented Programming Vs Object Oriented Programming
Basic Concepts of Object Oriented Programming
Benefits of Object Oriented Programming

3. Classes & Objects

Specifying a class, defining member functions, Inline function, Nesting of member functions, private member function, Static data members, static member functions, friend functions, returning objects, pointers to members.

4. Constructors & Destructors

Constructors, parameterized constructors, multiple constructors in a class, constructors with default arguments, copy constructors, dynamic constructors, const objects, and destructors.

5. Operator Overloading, Functional Overloading & Type Conversions

Unary Operators, Binary Operators, Using Friends as operator functions, Overloading other Operators, User defined conversion, Four different cases of user defined conversions, Comparison of both the methods of conversion

6. Inheritance

Defining derived class using single base class, Derivation using public, private and protected access modifiers, The implementation of inheritance in the C++ object model, The multiple-inheritance, Abstract classes, Composite objects (container objects)

7. Dynamic Polymorphism

Pointers to objects, this pointer, pointers to derived classes, virtual functions, pure virtual functions.

8. I/O streams

Introduction to stream, Advantages of using C++ I/O over C I/O, The C++ Predefined streams, Formatting I/O, Formatting using I/Os members, Manipulators, Creating our own manipulator

9. Data Files

Introduction to I/O, Text and binary streams, Opening and closing files, Dealing with text files, Dealing with binary files, Providing Random Access using seek, I/O Modes Handling Errors

10. Templates

Function Templates, Non Generic (Non Type) Parameters in Template functions, Template function and specialization, Overloading a template function, Using Default Arguments, Class Templates, Classes with multiple generic data types, Static data members, Primary and Partial Specialization, The Export Keyword.

Main Readings :

1. Object Oriented Programming with C++: Balagurusamy - TMH
2. OOP in Turbo C++: Robert Lafore - Galgotia Publication

Supplementary Readings :

1. C++ Primer :Lippman - Addison Wesley
2. Object Oriented Programming Fundamentals & Applications: Probal Sengupta - PHI
3. The Complete Reference: Schildt - Osborne
4. The C++ Programming Language: Stroustrup - Addison Wesley

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester III

Paper No : 305

L: 4 Hrs

Paper Title: Computer Networks

Credit: 4

1. Introduction to Networks

Data Communications: components, direction of data flow, Networking – Concepts, Need, Uses and advantages of Network, Categories of networks , Client, Servers and Peers based and Hybrid Networks, topologies

2. The OSI Model

Layer architecture, OSI Model, The OSI Model layer functions

3. Major Protocol Suits

Review of protocols, Models and implementations, Transport and Internet protocols

4. Physical Layer

Data and Signals, Digital Transmission, Analog transmission, Bandwidth, Transmission Media, Switching, IEEE 8.2 Standards

5. Data Link Layer

Functions of Data link layer, Error detection and correction, error detection and correction codes, data link control and protocols, Multiple access protocol: CSMA/CD, LAN: Ethernet, Introduction : Wireless LAN, Connecting devices: Repeaters, Hubs, Bridges, switches, Concept of VLAN

6. Network Layer

Connectionless service, Connection oriented service, internetworking, addressing, Routing algorithms (Distance vector, Link state), Introduction to Network layer in internet: Logical addressing, IP protocol, IP address, Classes of IP addresses, Routers, Brouters, Gateways

7. Transport Layer

Transport Service Primitives, addressing, connection establishment, flow control, multiplexing, Introduction to transport layer protocols and their features.

8. Session, Presentation and Application Layers

Introduction to : Establishing Session, Presentation with Content Encoding and Decoding
Introduction to application layer protocols.

9. Network Configuration and Administration

Installing and configuring network adapters, Managing network bindings, Sharing files and printers User profiles, Folder security, Account policies, Trust relationship between domains, Computer management, Workstation management

10. Network Security

Various Types of security, Security with certificates, Planning a security approach, Security problems and their consequences, Introduction to firewalls, Encryption and decryption standards, Secure Socket Layer, Virtual Private Networks

Main reading:

1. Data Communications and Networking, 4/e Behrouz A. Forouzan - DeAnza College
2. Computer Networks by A.S. Tanenbaum - PHI Publications

Supplementary Readings:

1. Computer Networks : A pragmatic Approach, C R Sharma, Jaico, 2005
2. Data and computer Communication, William Stallings - Pearson Education,
3. MCSE: Networking Essentials Study Guide - TMH
4. MCSE: Windows 2000 Network Infrastructure Design Study Guide -TMH
5. Mastering Local Area Networks by Christa Anderson & Mark Minasi – BPB

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester III

Paper No : 306

L: 0, T:0, P:10 Hrs

Paper Title : Practical.

Credit: 6

Practical shall be conducted for the Papers 303, 304

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT
M.Sc. (I.T.) [Five Year Integrated Course]
B.Sc. (Information Technology)
Semester III

Paper No : 307

2 Hrs

Paper Title : NSS/Sports/Saptdhara.

Credit: 2

Students shall be participate in any of the activities during the semester.