



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)

M.Sc. (IT) First Year (Two Semester)

Semester-I					
Course Code	Title of the paper	External	Internal	Total Credits	Total No. of Classes
		Credits	Credits		
M.Sc. IT-101	Fundamental of IT	3	1	4	40hrs
M.Sc. IT-102	Operating system	3	1	4	40hrs
M.Sc. IT-103	Programming in C	3	1	4	40hrs
M.Sc. IT-104	DBMS	3	1	4	40hrs
M.Sc. IT-105	Lab-1 (Programing in C)	2	0	2	60hrs
M.Sc. IT-106	Lab-2 DBMS + O.S	2	0	2	60hrs
Total Credits		16	4	20	320hrs

Semester-II					
Course Code	Title of the Paper	External credit	Internal credit	Total Credits	Nor of Classes
M.Sc. IT-201	Data Structure Using C	3	1	4	40hrs
M.Sc. IT-202	OOPS Through C++	3	1	4	40hrs
M.Sc. IT-203	Management Information System	3	1	4	40hrs
M.Sc. IT-204	Multi Media Technology	3	1	4	40hrs
M.Sc. IT-205	Elective-II	3	1	4	40hrs
	1: Web Designing				
	2: Information Security				
	3: Cyber law and Cyber Ethics				
M.Sc. IT-206	Lab-3 (Data Strucutre using C)	1	1	2	60hrs
M.Sc. IT-207	Lab-4(OOPS Through C++)	1	1	2	60hrs
M.Sc. IT-208	Seminar	1	0	1	40hrs
Total Credits		18	07	25	360hrs



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)
M.Sc. (IT) First Year (Two Semester)

M.Sc. IT-101

Fundamental of IT

(4-Credits)

Unit-I Computer System Characteristics And Capability

Basic structure, ALU, memory, CPU, I/O devices. Development of computers.

Classification of computers: (Micro, mini frame, super computer, pc, server, workstations)

Unit-II Data Representation With in Computer:

BIT, BYTE, WORD ASCII, EBCDIC, BCD Code Introduction to Number system: Binary, Octal, Decimal and Hexadecimal. Conversation from one number system to another number system. Introduction to Basic Gates.

Unit-III Input Devices and OutPut Devices:

Keyboard Direct Entry: Card readers, scanning devices (BAR CODE, OMR, MICR), Voice input devices, Light pen, Mouse, Touch Screen, Digitizer, Scanner Printers: Impact and Non-impact printers. CRT, LCD, CD-WRITTER, ZIP DRIVE, DVD Introduction to Web Camera, modem

Unit-IV Memory & Algorithm & Flowcharts:

RAM, ROM, PROM, EPROM, EEPROM

Base memory, extended memory, expanded memory, Cache memory Storage devices Tape, FDD, HDD, CDROM, Pen Drive. Definition and properties Principles of flowchart Flowchart symbols Converting algorithms to flowcharts.

Unit-V Introduction To Programming Environment & Microporcessor

History of languages, high-level, Low level, Assembly languages etc. Compilers, Interpreters, Assemblers, Linkers, Loaders. What is Microprocessor, Introduction to Family of microprocessor, Ideal microcomputer, An Actual microcomputer, Memory system for microcomputer, Minimum microcomputer configuration.

Unit-VI Voice and Data communication & DOS

Types of communications, Physical communication, Public Switched Telephone Network, Cellular communication system. What is DOS, History. Files and Directory

Study of all internal & External commands. Types of files. Configuration of DOS (config. sys)

Batch file concept & study of Autoexec.bat file. Booting Procedure of DOS, What are Windows O.S., History, files and Folders? Architecture of windows O.S., Study of windows directories.

Basics of windows: Desktop, My computer, Recycle bin, my network places, Quick launch tool bar.



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)
M.Sc. (IT) First Year (Two Semester)

Reference Books:

1. FUNDAMENTALS OF COMPUTERS BY V. RAJARAMAN.
 2. COMPUTERS AND COMMONSENSE BY R. HUNT AND SHELL Y.
 3. FUNDAMENTALS OF COMPUTER Systems. Low Price Edition.
 4. Microprocessor B.Ram.
 5. MS-Dos 6.22- Russell A Stultz (BPB Publication)
- Teach yourself Windows 2000 – Brain Underdahl



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)
M.Sc. (IT) First Year (Two Semester)

M.Sc. IT-102

OPERATING SYSTEMS

(4-Credits)

Unit-I Introduction to Operating System:

Definition of Operating System, Functions of Operating System, Multi-user, Multiprocessing, Multiprogramming: Time Sharing Systems, Real Time Systems, Hierarchical of Operating System

Unit-II Memory Management:

Single Contiguous, Partition Allocation, Relocatable Partitioned, Page Memory Management, Introduction to Demand Paged & segmented Memory Management

Unit-III Process Management:

What is process, Context Switching, Process Control Block, Job Scheduling process scheduling, Process Synchronization, Race Condition, Introduction to Deadlocks

Unit-IV Device Management:

Techniques of Device Management, Dedicated, Shared, Virtual Devices, Device Characteristics, Channels & Control Units, I/O traffic Controller.

Unit-V File System

A Simple file systems, General Model of file system, Symbolic file system

Unit-VI Parallel Processing

Introduction, What is Parallel Processing, Difference between distributed & Parallel processing, Advantages of parallel processing

Reference Books:

1. OPERATING SYSTEM BY STUART .E. MADNICK & JOHN. J. DONOVON
2. OPERATING SYSTEM BY MILAN MILENKOVIC (IBM CORPORATION)
3. OPERATING SYSTEM BY ACHYUTS GODBOLE
4. OPERATING SYSTEM BY H.M. DEITEL



M.Sc. IT-103 Introduction to Programming in C (4-Credits)

Unit-I Programming languages & Problem Solving

Machine language, Assembly language, High level languages, Compilers and Interpreters
Algorithms, Flowcharts

Unit-II Introduction to C & Tokens

History, Structure of a C program, Functions as building blocks, Application Areas
C Program development life cycle, C Tokens, Keywords, Identifiers, Variables, Constants – character, integer, float, string, escape sequences, Data types – built-in and user defined Operators and Expressions, Operator types (arithmetic, relational, logical, assignment, bitwise, conditional , other operators) , precedence and associativity rules.

Unit-III Input and Output & Control Structures

Character input and output, String input and output, Formatted input and output Decision making structures, If, if-else, switch, Loop Control structures, While, do-while, for Nested structures break and continue

Unit-IV Functions in C & Arrays

What is a function, Advantages of Functions, Standard library functions, User defined functions, Declaration, definition, function call, parameter passing, return keyword, Scope of variables, storage classes Recursion, Arrays, declaration, initialization, Types – one, two and multidimensional, Passing arrays to functions .

Unit-V Pointers, Strings & Structures

Pointer declaration, initialization, Dereferencing pointers, Pointer arithmetic, Pointer to pointer, Arrays and pointers, Functions and pointers – passing pointers to functions, function returning pointers, pointer to function

Dynamic memory allocation, Declaration and initialization, Standard library functions, Strings and pointers, Array of strings. Creating structures, Accessing structure members (dot Operator), Array of structures Passing structures to functions, Nested structures, Pointers and structures,

Unit-VI Unions, C Preprocessor & File Handling

Unions Difference between structures and unions, Format of Preprocessor directive, File Inclusion directive, Macro substitution, nested macro, argumented macro, Conditional compilation, Command Line Arguments, Accessing command line arguments, Streams, Types of Files, Operations on files, Random access to files.

References

1. Structured Programming approach using C – Forouzan and Gilberg, Thomson learning publications
2. The C Programming language – Kernighan and Ritchie
3. Complete C Reference – Herbert Schildt



Lab Assignments:

M.Sc.(IT).S1.PR1 – C Programming (100 Marks)

1. Assignment to demonstrate use of data types, simple operators (expressions)
2. Assignment to demonstrate decision making statements (if and if-else, nested structures)
3. Assignment to demonstrate decision making statements (switch case)
4. Assignment to demonstrate use of simple loops
5. Assignment to demonstrate use of nested loops
6. Assignment to demonstrate menu driven programs.
7. Assignment to demonstrate writing C programs to use of user defined functions
8. Assignment to demonstrate recursive functions.
9. Assignment to demonstrate use of arrays (1-d arrays) and functions
10. Assignment to demonstrate use of multidimensional array(2-d arrays) and functions
11. Assignment to demonstrate use of pointers
12. Assignment to demonstrate concept of strings (string & pointers)
13. Assignment to demonstrate array of strings.
14. Assignment to demonstrate use of bitwise operators.
15. Assignment to demonstrate structures (using array and functions)
16. Assignment to demonstrate structures and unions
17. Assignment to demonstrate command line arguments and preprocessor directives.
18. Assignment to demonstrate file handling (text files)
19. Assignment to demonstrate file handling (binary files and random access to files)

DBMS

1. Assignment to create simple tables , with only the primary key constraint (as a table level constraint & as a field level constraint) (include all data types)
2. Assignment to create more than one table, with referential integrity constraint, PK constraint.
3. Assignment to create one or more tables with following constraints, in addition to the first two constraints (PK & FK)
 - a. Check constraint
 - b. Unique constraint
 - c. Not null constraint
4. Assignment to drop a table from the database, to alter the schema of a table in the Database.
5. Assignment to insert / update / delete records using tables created in previous Assignments. (use simple forms of insert / update / delete statements)
6. Assignment to query the tables using simple form of select statement Select <field-list> from table [where <condition> order by <field list>] Select <field-list, aggregate functions > from table [where <condition> group by <> having <> order by <>]
7. Assignment to query table, using set operations (union, intersect)
- 8 Assignments to query tables using nested queries



Swami Ramanand Teerth Marathwada University, Nanded

Choice Based Course Credit System (distribution and details of CBCS)

M.Sc. (IT) First Year (Two Semester)

8. Assignment related to small case studies (Each case study will involve creating tables with specified constraints, inserting records to it & writing queries for extracting records from these tables)

OS

1. Introduction to DOS (Booting Process, Using basic commands like date, time, dir, copy con , type, ren etc.)
2. Creating a directory structure in Dos (Using commands md, cd, rd, copy) and batch file.
3. Introduction to Windows (File operations using windows explorer, Internet explorer, desktop related operations etc.)
4. Handling Windows Control Panel Issues.
5. Installation and handling plug and play devices with windows
6. Managing System Accessories and information.



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)
M.Sc. (IT) First Year (Two Semester)

M.Sc. IT-201 DATA STRUCTURES USING C (4-Credits)

Unit-I Introduction to data structures & Algorithm analysis

Concept, Data type, Data object, ADT, Need of Data Structure, Types of Data Structure
Algorithm – definition, characteristics, Space complexity, time complexity, Asymptotic notation
(Big O, Omega)

Unit-II Linear data structures & Linked List

Introduction to Arrays - array representation, sorting algorithms with efficiency, - bubble sort,
Insertion sort, Merge sort, Quick Sort, Introduction to List, Implementation of List – static &
dynamic representation, Types of Linked List, Operations on List, Applications of Linked List –
polynomial manipulation, Generalized linked list – concept & representation

Unit-III Stacks & Queues

Introduction, Representation-static & dynamic, Operations, Application - infix to postfix &
prefix, postfix evaluation, 5.5 Recursion using implicit stack Concept of Multiple stacks

Unit-IV Queues

Representation -static & dynamic, Operations, Circular queue, DeQueue, priority queues
Concept of Multiple Queues

Unit-V Trees

Concept & Terminologies, Binary tree, binary search tree, Representation – static & dynamic
Operations on BST – create. Insert, delete, traversals (preorder, inorder, postorder), counting
leaf, non-leaf & total nodes Application - Heap sort Height balance tree- AVL trees- Rotations

Unit-VI Graph

Concept & terminologies, Graph Representation, Traversals – BFS & DFS Applications – AOV
network – topological sort AOE network – critical path, Shortest path with implementation

References:

1. Fundamentals of Data Structures ---- By Horowitz Sahani (Galgotia)
2. Data Structures using C --- By ISRD Group (Tata McGraw Hill)
3. Introduction to Data Structures using C---By Ashok Kamthane
4. Data Structures using C --- Bandopadhyay & Dey (Pearson)



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)

M.Sc. (IT) First Year (Two Semester)

M.Sc. IT-202

OOPS Through C++

(4-Credits)

Unit-I Object oriented concepts

Object oriented methodology, Features, advantages and Applications of OOPS, Data types, new operators and keywords, type conversion in C++ , Introduction to reference variables, Classes & Objects

Classes & Object specifiers, Defining data members and member functions, Array of objects, Managing console I/O , C++ stream classes, Formatted and unformatted console I/O, Usage of manipulators

Unit-II Function in C++

Call by reference, Return by reference, Function overloading and default arguments, Inline function

Static class members, Friend functions

Unit-III Constructors and destructor & Operator overloading

Types of constructors, memory allocation (new and delete), usage of destructor overloading unary and binary operators, overloading using friend function, usage of this pointer overloading insertion and extraction operator

Unit-IV Inheritance & Working with files

Types of inheritance with examples, virtual base classes and abstract base classes, constructor and destructor in derived class, virtual functions and pure virtual function , File operations File pointer and their manipulation, File updation with random access

Unit-V Templates

Introduction to templates, Class templates, function templates and overloading of function templates

With multiple parameters, CASE study on STL (with reference to container classes, operational utilities)

Unit-VI Exception Handling in C

try, catch and throw primitives

Reference Books: -

1. Object Oriented Programming with C++ by Robert Lafore
 2. Object Oriented Programming with C++ by E. Balagurusamy
 3. Object Oriented Modeling and Design by James Rambough
 4. The Complete Reference C++ by Herbert Schildt
- Let us C++ by – Yashwant Kanitkar



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)
M.Sc. (IT) First Year (Two Semester)

M.Sc. IT-203

Management Information System (4-credits)

Unit-I Introduction to Management Information Systems

Overview of Management Information System., Structure of Management Information system, MIS: Support to Management, MIS and the user., Management as a control system.

Unit-II Information Systems Technology

Hardware, Software & communication technology for information systems., Transaction processing, office automation, Information processing control functions.

Unit-III Conceptual Foundations

The decision-making process, Concepts of information, Human as Information processors. 3.4 Systems concepts, planning & control.

Unit-IV E-business Enterprise

Introduction, Organization of business in an E-enterprise., E-business, E-communication & E-collaboration

Unit-V Information Security Challenges in E-enterprises

Security Threats & Vulnerability, Controlling security threat and vulnerability.MIS & Security challenges

Unit-VI Development, Implementation and Management of MIS Resources and Applications

Developing and implementing application systems. Quality assurance and evaluation of information systems. MIS: Development process model. Application in Manufacturing Sector. MIS for Personnel Management, Financial Management, Production management, Raw Materials management & Marketing management. Application in Service Sector
Introduction, Service concept, service process cycle and analysis, customer service design, service management system.

References:

1. MIS: Conceptual Foundations, structure & development by Gordon B.Davis, Margrethe H.Olson, Tata McGraw Hill.
MIS, Text & Cases, Third Edition by Waman S. Jawadekar, Tata McGraw Hill.



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)
M.Sc. (IT) First Year (Two Semester)

M.Sc. IT- 204

Multimedia Technology

(4-credits)

Unit-I Introduction

Branch overlapping Aspects of Multimedia, Content, Global structure, Multimedia Literature

Unit-II Multimedia: Media and Data Stream

Medium, Main properties of a multimedia system, multimedia, traditional Data stream Characteristics, Data stream Characteristics for continuous media, information units

Unit-III Sound/Audio & . Images and Graphics

Basic sound concepts, Music, speech, Basic concepts, Computer Image processing

Unit-IV Video and Animation

Basic concepts, Television, Computer-based animation

Unit-V Data compression & Optical storage Media

Storage space, Coding requirements, source Entropy and Hybrid encoding, some Basic compression Techniques, Jpeg, H. 261,MPEG, DVI, Basic Technology, Compact Disk Read only Memory, CD-ROM Extended architecture, Further CDROM based developments, Compact disk write once., Compact Disk Magneto Optical8

Unit-VI User Interfaces

General Design Issues, Current Work, Extension through audio and video, Audit at user Interface, user Friendliness as primary Goal

Text Books:

1. Multimedia computer communication-stein Metz and Nahrstedt
2. Multimedia system Design- Thakarr
3. Multimedia Computing Communication & Application-Ralf Strinmrpz
4. Multimedia System- Bufford John F(Pearson Education Asia)
5. Multimedia Magic-S Gokul(BPB Publication)



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)
M.Sc. (IT) First Year (Two Semester)

Elective-II (205) Web Designing (4-Credits)

Unit-I Internet basics

History and basic idea of Internet; Internet services: telnet, e-mail, ftp, WWW.
Web page design: Designing web pages with HTML- use of tags, hyperlinks, URLs, tables, text formatting, graphics & multimedia, imagemap, frames and forms in web pages. Use of Cascading Style Sheet in web pages.

Unit-II Creating interactive and dynamic web pages with JavaScript

JavaScript overview; constants, variables, operators, expressions & statements; user-defined & built-in functions; client-side form validation; using properties and methods of built-in objects.

Unit-III Markup language basics

Standard Generalized Markup Language (SGML) - structures, elements, Content models, DTD, attributes, entities.

Unit-IV Extensible Markup Language (XML)

Introduction- using user-defined tags in web pages; displaying XML contents; XML DTDs; use of XSL.

Unit-V Web Browsers

functions and working principle of web browsers; plug-ins & helper applications; conceptual architecture of some typical web browsers.

Unit-VI Introduction to Client/Server Computing: client-server computing basics; types of Client/Server systems; middleware; N-tiered systems: 2-tier/3-tier/4-tier systems; Fat Clients versus Fat Servers. Web Servers: Web services and web server functionality; web server composition; registration; HTTP, IP address, DNS & ports; conceptual architecture of some typical web servers. Server-side scripting: overview of CGI, ASP, and JSP. Server side scripting using PHP; Web database connectivity- introduction to ODBC; PHP with database connectivity.

References

1. Complete Reference HTML
2. Head First HTML with CSS and XHTML O'Reilly Publication Elizabeth Robson



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)
M.Sc. (IT) First Year (Two Semester)

Elective-II (205) Information Security (4-Credits)

Unit-I Introduction

Introduction to assessing Network Vulnerabilities: type and procedure of network vulnerability assessment

Unit-II Principles of Security

Principles of Security Information Classification, Policy framework, role based security in an organization

Unit-III Risk Assessment & Risk Assessment Methodologies

Laws, Mandates and Regulations, Risk assessment best practices, Risk assessment best practice. Defense –in depth approach, risk analysis, Asset valuation approach, Quantitative and Qualitative risk-assessment approaches. Scoping the project, Understanding the attacker

Unit-IV Performing the Assessment

Vulnerability scan and Exploitation: Internet Host and network enumeration, IP network Scanning, Assessing Remote Information Services, Assessing Web servers, Assessing Web Applications, Assessing Remote Maintenance Services, Assessing Database services, Assessing Windows Networking Services, Assessing Email services

Unit-V Performing the Assessment

Open source tools used for Assessment and Evaluation, and exploitation framework

Unit-VI Report Preparation

Final Report Preparation and Post Assessment Activists

Reference books:

1. Network Security assessment, Chris McNab, O'reilly
2. Inside Network Security Assessment, Michael Gregg, Pearson
3. Security in Computing, fourth Edition, Charles Pfleeger, Pearson
4. The Security Risk Assessment Handbook: Douglas LanDoll, Auerbach Publication.
5. Nina Godbole, "Information Systems Security", Wiley
6. Cyber Security: Sunit Belapur, Wiley



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)

M.Sc. (IT) First Year (Two Semester)

Elective-II (205) Cyber law and Cyber Ethics (4-Credits)

Unit-I Fundamentals of Cyber Law

Jurisprudence of Cyber Law, Overview of Computer and Web Technology, Electronic Governance the Indian perspective, Overview of General Laws and Procedures in India

Unit-II E-commerce- Legal issues

Digital Signatures and the Indian Law, Electronic Contracts, The UNCITRAL Model law on Electronic Commerce.

Unit-III Types of Cyber crimes

Hacking, cyber pornography, cyber terrorism, Cyber contraventions Penalties under the Act. Regulation of cyber crimes Issues relating to investigation, issues relating to jurisdiction, issues relating to evidence

Unit-IV Intellectual Property Issues

Overview of Intellectual Property related, Legislation in India, Copyright law and conventional crimes, Cyber criminals and their objectives.

Unit-V Attacks on Computers and Computer Security

Introduction, The Need for Security, Principles of Security, Types of Attacks

Unit- VI Cryptography & Symmetric Key Algorithms and AES

Concepts and Techniques, Plain text and Cipher Text, Substitution Techniques Transportation Techniques, Encryption and Decryption, Symmetric and Asymmetric Key Cryptography Algorithm types and Algorithm modes, An Overview of Symmetric Key Cryptography, Data Encryption Standards (DES), International Data Encryption Algorithm (IDEA) Asymmetric Key Algorithms: Overview of Asymmetric Key Cryptography, The RSA Algorithm

Reference Books:

1. Cyber Law: A Legal Arsenal for Online Business by Brett J. Trout
2. Cyber Law: Maximizing Safety and Minimizing Risk in Classrooms by Aimée M. Bissonette
3. Cryptography and Network Security., Atul Kahate.
4. Cryptography and Network Security: Principles and practices., William Stallings-Third Edition.



Swami Ramanand Teerth Marathwada University, Nanded
Choice Based Course Credit System (distribution and details of CBCS)

M.Sc. (IT) First Year (Two Semester)

M.Sc.(IT).S2.PR1- C++ (100 Marks)

Should cover at least 20 programs based on its theory syllabi.

M.Sc.(IT).S2.PR2- Data Structure using C (100 Marks)

1. Sorting Algorithms – Bubble sort, Insertion, selection, quick sort and merge.
2. Static/Dynamic stack implementation, infix to postfix, infix to prefix and evaluation of postfix.
3. Static and Dynamic Queue Implementation.
4. Singly Linked List, Doubly Linked List and Circular Linked List.
5. Polynomial addition (Using Linked list).
6. Binary Tree Traversal: Create, add, delete, display nodes.
7. Graph: in degree, out degree, DFS, BFS.
8. Shortest path Dijkstra algorithm.
Adjacency matrix to adjacency list conversion