

M.Sc (Information Technology)

PROGRAM OUTCOMES(PO)

PO1: Will have the ability to communicate computer science concepts, designs, and solutions effectively and professionally. Apply knowledge of computing to produce effective designs and solutions for specific problems. Identify, analyze, and synthesize scholarly literature relating to the field of computer science; and use software development tools, software systems, and modern computing platforms.

PO2: Work in a collaborative manner with others on a team, contributing to the management, planning and implementation of a computer system.

PO3: Independently propose a small scale research project, plan its execution, undertake its development, evaluate its outcome and report on its results in a professional manner.

PO4: Advance knowledge through innovation and knowledge creation. Pursue life-long learning in practice. Interpret and present theoretical issues and empirical findings.

PROGRAM SPECIFIC OUTCOMES(PSO)

PSO1: Gains understanding about techniques, technologies and methods used in managing and implementing information technology systems.

PSO2: Widens and deepens understanding of computing technologies and covers high level concept that enable the effective management and planning of IT project and services.

PSO3: High level strategy and design in-depth technical specializations, management and planning of IT project and services.

COURSE OUTCOMES

COURSE NAME: MIT-101 Analysis & Design of Embedded Systems

CLASS - M.Sc. Information Technology SEMESTER – I

Course Objectives:

1. To have knowledge about the basic working of a microcontroller system and its programming in assembly language.
2. To provide experience to integrate hardware and software for microcontroller applications Systems.

Course Outcomes:

To acquire knowledge about microcontrollers embedded processors and their applications.

1. Foster ability to understand the internal architecture and interfacing of different peripheral devices with Microcontrollers.
2. Foster ability to write the programs for microcontroller.

3. Foster ability to understand the role of embedded systems in industry.
4. Foster ability to understand the design concept of embedded systems.

COURSE NAME: MIT-102 Distributed Computing

CLASS - M.Sc. Information Technology SEMESTER – I

Objective of the Course:

To provide in-depth study in the area of distributed computing on models, architectures, algorithms and techniques and to allow the student to:

- Acquire fundamental knowledge in distributed computing.
- Learn about advanced distributed computing concepts.
- Understand limitations and appreciate innovative solutions.
- Apply the knowledge in distributed application development and problem solving.

Course Outcomes:

a) Knowledge and Understanding: Students will

- Outline the potential benefits of distributed systems.
- Summarize the major security issues associated with distributed systems along with the range of techniques available for increasing system security.
- Understand the concepts of distributed database systems and synchronization algorithms.
- Learn distributed operating systems and token based algorithms.
- Understand the concepts of process and resource management in distributed computing environment.

b) Intellectual Cognitive/Analytical Skills: Students will be able to

- Apply standard design principles in the construction of these systems.
- Select appropriate approaches for building a range of distributed systems.
- Gain knowledge on Distributed operating system concepts- multi-processor operating system and database operating systems.
- Acquire knowledge on the process of communication and interconnection architecture of multiple computer systems.

c) Practical Skills: Students will learn to:

- Apply Security techniques in Distributed System.
- Manage Distributed Shared Memory.
- Analyze and understand the concepts of synchronization of clocks and deadlocks.

d) Transferable Skills: Students will be able to

- Apply the different measures for protection and security in operating systems.

COURSE NAME: MIT-103 Advanced Computer Organization and Architecture
CLASS - M.Sc. Information Technology **SEMESTER – I**

Objectives of the Course:

Students will get familiar with

1. Conceptualize the basics of organizational and architectural issues of a digital computer.
2. Analyze processor performance improvement using instruction level parallelism.
3. Learn the function each element of a memory hierarchy.
4. Study various data transfer techniques in digital computer.
5. Acquainting the students with principles and concepts of parallel processing including parallel computer architectures, performance metrics, the scheduling problem and parallel algorithms.

Program Learning Outcomes:

(Knowledge and Understanding, Intellectual Skills, practical Skills, Transferable skills).

A. Knowledge and Understanding):

Students will be able to

- Define the basics of Computer Systems.
- Demonstrate the basics of Computer Components.
- Articulate design issues in the development of processor or other components that satisfy design requirements and objectives.

B. Intellectual(Cognitive/ Analytical) Skills:

Students will be try to

- Recognize and assemble components.
- Develop Analytical Skills.
- Compare methods with data.

C. Practical Skills

Students will be able to

- Choose the appropriate Operating system.
- Develop computer-based systems.
- Evaluate systems in terms of quality attributes.

D. Transferable Skills :

Students will be able to

- Use different Problem Solving techniques.
- Follow Analytical Thinking.
- Follow Creative Thinking.
- Practice Designing skills in software projects.
- Practice Engineering skills for software development

COURSE NAME: MIT-104 Network Operating Systems

CLASS - M.Sc. Information Technology SEMESTER – I

Course Objectives:

The goal is to give the students experience with Network Operating System (Server) structure and management so that when they enter the workforce, they already have skills that set you apart from other candidates who only have a textbook understanding of servers. The emphasis will be on real-world application of the material so that they have a practical appreciation of the information.

Learning Outcomes:

Upon successful completion of the course, the student should be able to:

- Demonstrate an understanding of the principles, practices and goals of system administration.
- Demonstrate an understanding of system components, the advantages of Unix-like and Windows-like OS, major networking models, network addressing and naming systems, network services.
- Demonstrate an understanding of the major approaches to computer management in the network environment.
- Demonstrate an understanding of the features of the Windows 2003 Server Operating System.
- Perform the installation of Windows 2003 OS and configure the server environment.
- Demonstrate an understanding of Active Directory and its key features.
- Perform user accounts management and implement security groups.
- Perform configuration, management, and troubleshooting of folders, files, and printing resources.
- Demonstrate an understanding of the configuration and management of data storage.
- Demonstrate an understanding of Group Policies to secure Windows 2003 Server.
- Perform network services installation and management.
- Use server and network monitoring software tools.

- Describe the elements of an effective troubleshooting methodology and use a variety of software and hardware tools to diagnose problems.
- Demonstrate an understanding of network backup and recovery strategies and how to protect a network from viruses.
- Use Network OS administration techniques to provide basic security.

COURSE NAME: MIT-105 Computational Problem Solving Using Python

CLASS - M.Sc Information Technology SEMESTER – I

Objective of the course:

It aims at acquainting students better with the process of Computational Problem Solving, Python Programming Language fundamentals. Students will enrich their programming skills using Data types, List Structures, Control Structures, Functions, Objects and their Use, Modular Design and Text files handling using Python Language. Python is a very powerful language and is used in various domains so there is better career prospectus for the students after grasping thorough knowledge about Python programming. Career prospectus after completion of course of study are as Programmer, Web developer, Data Scientist, Information Officer, Application analyst, IT consultant, IT technical support officer and allied jobs. Further Knowledge of usage of Python libraries and other allied technical skills are essential for achieving heights in this field.

The key goal is to prepare students for a professional career in the field of Programming, Web development, Data Science etc.

- To get acquaint students with good knowledge of Programmingskills.
- To get acquaint students with various case studies using Python.

Course Outcomes:

- a) Knowledge & Understanding : Python programming.
- b) Intellectual Cognitive/ analytical skills: Application development.
- c) Practical Skills :Programming for application development and data science.
- d) Transferable skills: Ability to define a practical problem, Data structure and Modular approach.

COURSE NAME: MIT-201 Mobile Computing

CLASS - M.Sc Information Technology **SEMESTER – II**

Course Objectives

To impart fundamental concepts in the area of mobile computing, to provide a computer systems perspective on the converging areas of wireless networking, embedded systems, and software, and to introduce selected topics of current research interest in the field.

Course Outcomes:

- Understand fundamentals of wireless communications.
- Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks.
- Demonstrate basic skills for cellular networks design.
- Apply knowledge of TCP/IP extensions for mobile and wireless networking.

COURSE NAME: MIT-202 Distributed Databases

CLASS - M.Sc Information Technology **SEMESTER – II**

Objective of the course:

It aims at acquainting students better with the basics of Distributed DBMS, different Architectural Models for DDBMS, Data allocation, Relational Database Design, Information Requirements for Data allocation, Query Processing & Optimization in context of distributed databases. Career prospectus after completion of course of study are as Data manager, Data administrator, Database analyst, Database designer and allied jobs. Further Knowledge of database management systems software and strong programming skills are essential for achieving heights in this field.

- The key goal is to prepare students for a professional career in the field of data administration and database design.
- To get acquaint students with good knowledge of Distributed DBMS. During the course, students will learn about data distribution, data distribution mechanism/ techniques along with its pros/cons.
- To get acquaint students with Query Decomposition and Distributed Concurrency Control issues, methods and their merits and demerits.

Course Outcomes:

- Knowledge & Understanding : Distributed Databases and their design & development
- Intellectual Cognitive/ analytical skills: Data Distribution and Allocation strategies
- Practical Skills : Algorithmic knowledge about distributed database design and allocation

- Transferable skills: Usage of DDBMS design and allocation models

COURSE NAME: MIT-203 Image Processing

CLASS - M.Sc Information Technology

SEMESTER – II

Objectives of the Course:

- To learn and understand the fundamentals of digital image processing, and various image Transforms, Image Enhancement Techniques, Image restoration Techniques and methods, image compression and Segmentation used in digital image processing.
- To have understanding about various algorithms of Digital Image Processing so that the respondent may be able to implement in their practical.

Learning Outcomes:

A. Knowledge and Understanding:

Students will be

- This course introduces digital image processing. It focuses on the theory and algorithms underlying a range of tasks including acquisition and formation, enhancement, segmentation, and representation.

B. Intellectual (Cognitive/ Analytical) Skills:

Students will be able to

- An ability to apply knowledge of computing and mathematics appropriate to the discipline.
- An ability to analyze a problem and identify the computing requirements appropriate for its solution; an ability to design, implement and evaluate a computer-based system, process, component or program to meet desired needs.
- An ability to apply mathematical foundations, algorithmic principles and computer science theory to the modeling and design of computer based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

C. Practical Skills

Students will be able to learn:

- Develop programs in their practical labs.

D. Transferable Skills:

Students will be able to

- To develop interest in research oriented approach towards the course content so as to take this course as domain for their project work at later stage.

COURSE NAME: MIT-204 Fuzzy Systems

CLASS - M.Sc Information Technology

SEMESTER – II

Objective of this course is :

- To understand the fundamental theory and concepts of Fuzzy sets theory, Fuzzy relations.
- To understand the concepts of Properties of Membership Functions.
- To understand the basics of an evolutionary computing paradigm known as genetic algorithms and its application to engineering optimization problems.
- To understand decision making using Fuzzy information.
- To understand the use of MATLAB in Fuzzy Logics.

Course Outcomes:

a) Knowledge and Understanding: Students will

- Understand the concepts of Fuzzy Systems, ANN, Genetic Algorithms and its applications.
- Understand the concepts of feed forward neural networks and learning and understanding of NETWORKS AND FUZZY feedback neural networks.
- Understand the concept of fuzziness involved in various systems and fuzzy set theory.
- Comprehensive knowledge of fuzzy logic control and adaptive fuzzy logic.
- Gain adequate knowledge of application of fuzzy logic control to real time systems.

b) Intellectual Cognitive/Analytical Skills: Students will be able to

- Identify process/procedures to handle real world problems using Fuzzy Logics.
- Analyze and apply the neural networks to solve classification and functions approximation.

c) Practical Skills: Students will learn

- Back Propagation Networks for real world problems.
- Fuzzy logic in Industrial application.
- Implementation of Genetic Algorithms for optimization problems.
- Designing of fuzzy membership functions and construct fuzzy logic control systems for simple applications.

d) Transferable Skills: Students will be able to

- Apply fuzzy logic and reasoning to handle uncertain data to solve various fields of engineering problems.
- Design hybrid system to revise the principles of Fuzzy Logics in various applications.

COURSE NAME: MIT-205 Network Design and Performance Analysis

CLASS - M.Sc Information Technology

SEMESTER – II

Objectives of Course:

- To teach students how to evaluate a network situation,
- To help students to identify the most important network aspects that need to be monitored and analysed.
- Teach network modelling and simulation

COURSE OUTCOMES

At the end of this course the student shall be able to:

- Describe and develop a network model using analysis and simulation
- Design a new network model to meet requirements for new and existing networks.
- Use quantitative and qualitative techniques to design or upgrade a network
- Make decisions on the proper network technologies, routing protocols, network topologies, node placement, etc.
- Troubleshoot and diagnose network problems
- Identify network issues, risks, bottlenecks, etc

COURSE NAME: MIT-301 Network Protocols

CLASS - M.Sc Information Technology

SEMESTER – III

Objectives of the Course:

There are specific protocols or rules and standards that every device must follow to access the Internet and to communicate over a network. In this course, you will examine the principles of network communication, how networks are designed and what specifically is being sent and received by different devices when we send pictures, text messages, video or any other data across the network. What exactly is sent and how is it sent are the questions that will be answered in this course.

Course Outcomes:

At the end of this course, you will be able to:

1. Explain how protocols and standards benefit a global internet network.
2. Describe how the Ethernet Protocol transmits data within a LAN.
3. Explain IPv4 addressing and the role subnet masks.
4. Use Cisco Packet Tracer to connect hosts to a wireless router in a LAN.
5. Use a protocol analyzer or "packet sniffer" to open and examine a data packet that has been transmitted across a network.
6. Examine a Windows computer to locate the physical or MAC address used send and receive data

COURSE NAME: MIT-302 Advanced Web Technologies

CLASS - M.Sc Information Technology

SEMESTER – III

Objectives:

The objective of this course is to get familiarize with Microsoft.Net, C#, and ASP.NET technologies. This is designed to understand the different concepts and features of .NET coding, debugging and developing of Windows and web applications.

Outcomes:

- **Knowledge and Understanding:** Learn web development model view controller principles, data structures, and libraries. The subject matter of the course is object-oriented development in the ASP.NET MVC using the C# language.
- **Intellectual Cognitive/ Analytical Skills:** Develop critical thinking skills through solving programming problems in practical assignments, on projects, and on tests.
- **Practical Skills:** . Successful students will be able to design web applications using ASP.NET. They will be able to use ASP.NET controls in web applications and will be able to debug and deploy ASP.NET web applications. They will be able to create database driven ASP.NET web applications and web services
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

COURSE NAME: MIT-303 Linux Administration

CLASS - M.Sc Information Technology

SEMESTER – III

Objectives of the Course:

- To learn the fundamentals of Operating Systems.
- To learn the mechanisms of OS to handle processes and threads and their communication .
- To learn the mechanisms involved in memory management in contemporary OS
- To gain knowledge on distributed operating system concepts that includes architecture, Mutual exclusion algorithms, deadlock detection algorithms and agreement protocols.
- To know the components and management aspects of concurrency management .
- To learn programmatically to implement simple OS mechanisms.

Program Learning Outcomes:

(Knowledge and Understanding, Intellectual Skills, practical Skills, Transferable skills).

Learning Outcomes:

Knowledge and Understanding):

Students will

- Simple Programs and Development environment
- Datatypes
- Primitive Datatypes
- Variables, Operator, Selection Statements, Iteration statements (Loops)

- Jump Statements, Array, Classes ,Class Inheritance Abstract, Class And Methods

COURSE NAME: MIT-304 System Simulation

CLASS - M.Sc Information Technology

SEMESTER – III

Objectives of Course:

The aim of this course is to introduce various system modeling and simulation techniques, and highlight their applications in different areas. It includes modeling, design, simulation, planning, verification and validation. After learning the simulation techniques, the students are expected to be able to solve real world problems which cannot be solved strictly by mathematical approaches. This course begins by demonstrating the usefulness of simulation as a tool for problem solving in business, industry, government, and society.

- To understand the concept of System Simulation and its application in real world.
- To understand the different types of System Simulation and the usage.
- To understand the concept of random number generation in discrete simulation.
- To understand queuing simulation process in detail.
- To learn about models of Inventory Control.
- To understand experimental layout of simulation experiment.

COURSE OUTCOMES

At the end of this course the student shall be able to:

Knowledge and understanding :-

- Understand different methods for random number generation
- Have a clear understanding of the need for the development process to initiate the real problem.
- Have a clear understanding of principle and techniques of simulation methods informed by research direction.

Cognitive skills (thinking and analysis) –

- Be able to describe the components of continuous and discrete systems and simulate them .
- Be able to model any system from different fields.
- Be able to implement numerical algorithm to meet simple requirements, expressed in English .
- Be able to discuss the simulation methods and select the suitable technique on the problems.

Communication skills (personal and academic). –

- Know how to simulate any discrete system using queuing systems

- Be able to work effectively with others

Practical skills

- Use a range of commercial software packages to construct, verify and validate models of the given systems

COURSE NAME: MIT-305 Microprocessor and Its Applications

CLASS - M.Sc Information Technology SEMESTER – III

Course Objective:

- To introduce students with the architecture and operation of typical microprocessors and microcontrollers.
- To familiarize the students with the programming and interfacing of microprocessors and microcontrollers.
- To provide strong foundation for designing real world applications using microprocessors and microcontrollers.

Course Outcomes:

- Evaluate and solve basic binary math operations using the microprocessor and describe the microprocessor's and Microcontroller's internal architecture and its operation within the area of manufacturing and performance.
- Apply knowledge and demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target microprocessor and microcontroller.
- Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) and Microcontroller to meet specified performance requirements.
- Analyze assembly language programs; select appropriate assemble into machine a cross assembler utility of a microprocessor and microcontroller.
- Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.
- Evaluate assembly language programs and download the machine code that will provide solutions real- world control problems.

COURSE NAME: MIT-401 Advanced Java Technology

CLASS - M.Sc Information Technology SEMESTER – IV

Objectives of the Course:

This course aims at introducing students to object oriented programming (OOP) using the Java programming language, fundamental features like object classes and interfaces, exceptions and libraries of object collections. Its main objective is to teach the basic concepts and techniques which form the object oriented programming paradigm.

Program Learning Outcomes:

Knowledge, understanding, application, analysis, synthesis and evaluation

- knowledge of the structure and model of the Java programming language
- use the Java programming language for various programming technologies
- evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements
- propose the use of certain technologies by implementing them in the Java programming language to solve the given problem
- choose an approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems

COURSE NAME: MIT-402 Network Security

CLASS - M.Sc Information Technology

SEMESTER – IV

Objectives of the Course:

A network security course discusses different types of malicious attacks and various methods of responding to them. Students learn how to protect computer networks by using security codes. The course also examines malware, social engineering attacks, operating system holes, web security, privacy and e-mail hacking.

Course Outcomes

- Upon successful completion of this course, the student should be able to:
- Recognize the basic working principles of computer networks.
- Identify threats to network security.
- Distinguish between various protocols employed to secure networks.
- Utilize network security tools.
- Specify procedures for defending network systems.
- Develop network security policies.
- Specify procedures for recovery from attacks on networks.

COURSE NAME: MIT-403 Artificial Neural Network

CLASS - M.Sc Information Technology

SEMESTER – IV

Course Objectives:

This course aims at introducing the fundamental theory and concepts of computational intelligence methods, in particular neural networks, fuzzy systems, genetic algorithms and their applications in the area of machine intelligence. This can be summarized as:

1. To understand the fundamental theory and concepts of neural networks, neuro-modeling, several neural network paradigms and its applications.
2. To understand the basics of an evolutionary computing paradigm known as genetic algorithms and its application to engineering optimization problems.

Learning Outcomes:

- Understand generic machine learning terminology
- Understand motivation and functioning of the most common types of deep neural networks
- Understand the choices and limitations of a model for a given setting
- Apply deep learning techniques to practical problems
- Critically evaluate model performance and interpret results
- Write reports in which results are assessed and summarized in relation to aims, methods and available data