

## **PROGRAMME NAME: MASTER OF SCIENCE (INFORMATION TECHNOLOGY)**

Students are expected to achieve the following objectives by the end of the program.

**PSO1:** The subject of Information Technology is one of the important application tool which can be applied to different areas in teaching, training and learning which is considered to be important in terms of human resource development, Information Processing and Decision Making which enhances the development of a Nation.

**PSO2:** Information Technology as an application science is studied to be applied for other areas, right from Mathematics to other basic sciences, applied sciences, social sciences and each and every aspect of human life.

**PSO3:** The main aim of the course is to focus on the technological tools and concepts available and how they can be applied to the developmental processes.

**PSO4:** Information Technology Experts are very much required right from academic institutions, Research and Development to Industries both Public and Private Sectors.

## **MASTER OF SCIENCE (INFORMATION TECHNOLOGY) SEM I**

**PROGRAMME CODE: S01111**

### **COURSE NAME: DATA MINING**

#### **COURSE OUTCOME:**

**CO1:** Students learn to evaluate and implement wide range of emerging and newly adopted methods and technologies to facilitate knowledge discovery. Learn the concepts of database technology which has led to need of data mining and its applications.

**CO2:** Students understand the concept of different types of data to be mined and apply statistical pre-processing methods to any given raw data to make data ready for analysis. Discover different patterns of data for analysis.

**CO3:** Students learn to evaluate and select appropriate data mining algorithms for classification and prediction such as k nearest, native bayes etc.

**CO4:** Students learn to evaluate and select appropriate data mining algorithms for clustering such as k means and also get to know how clustering is useful.

**CO5:** Students are able to generate some raw data (text) and perform different text mining techniques to get the data in proper format for further analysis. Also learn how virtualization helps in free up valuable IT resources using social network analysis and helps understand structure and behaviour of social networks

## **COURSE NAME: DISTRIBUTED SYSTEM**

### **COURSE OUTCOME:**

**CO1:** Students understand the definition and Characterize Distributed Systems and it's applications in day to day working. Identify and categorize real world examples with respect to distributed transparencies. Apply the system models like interaction, security etc. to solve the real world DS problems.

**CO2:**Students understand Comparative and critical analysis on the types of networks like LAN, MAN, WAN, PAN and their implementation in contemporary areas like Ethernet, Wi-Fi and Bluetooth.

**CO3:** Students learn to implement Remote Procedure Call, Remote Method Invocation using Socket programming and Java API to execute Client - Server problems. Develop SOAP and REST web services in IDE to carry out arithmetic and database transactions. Categorize and understand the working of several indirect communication applications like YouTube, Messengers, and Email etc.

**CO4:** Students are able to apply different algorithms like Cristian, Berkeley etc. to synchronize the local clocks on their devices with the global clock. Create applications for synchronization using Timestamps. Differentiate between physical, logical and vector clocks. Implement the mutual exclusion and election algorithms like Ring and Bully using Java API.

**CO5:** Students are able to classify the different types of Distribution Transactions. Implement Two-Phase Commit Protocol programmatically. Define the usage and prevalence of distributed computing in Mobile and Ubiquitous systems.

## **COURSE NAME: DATA ANALYSIS TOOLS**

### **COURSE OUTCOME:**

**CO1:** Students gain knowledge of Statistics in Modern day with Example

**CO2:** Students gain knowledge of Graphics in detail

**CO3:** Students are able to compute the Sample distributions in detail

**CO4:** Students learn to write in detail about linear projections

**CO5:** Students learn the Monte Carlo

### **COURSE NAME: SOFTWARE TESTING**

#### **COURSE OUTCOME:**

**CO1:** Students understand testing, ethics and metrics and measurement

**CO2:** Students are able to identify and documenting test conditions

**CO3:** Students are able to identify and analyze risk

**CO4:** Students understand black box and white box testing techniques

**CO5:** Students understand the types of reviews and incident management.

### **MASTER OF SCIENCE (INFORMATION TECHNOLOGY) SEM II**

#### **PROGRAMME CODE: S01112**

### **COURSE NAME: MOBILE COMPUTING**

#### **COURSE OUTCOME:**

**CO1:** Students understand wireless transmission

**CO2:** Students learn to write down the classification of telecommunication system

**CO3:** Students understand wireless LAN

**CO4:** Students understand mobile network layer in detail

**CO5:** Students understand mobile transport layer in detail

## **COURSE NAME: ADVANCED COMPUTER NETWORKS**

### **COURSE OUTCOME:**

**CO1:** Students understand Enumerate layers of TCP/IP and OSI and functions of each layer. Understand and building the skills of subnetting and routing.

**CO2:** Students understand different high level operations of OSPF and note the difference between different LSA types. Also understand what stubby areas

**CO3:** Students gain knowledge of how OSPF is different from BGP. Find out different functionalities of IPV6 header fields.

**CO4:** Students learn to explore NAT in enterprise and external partner and also learn about trunk and also explore about different thinking protocols like VLAN trucking protocol.

**CO5:** Students understand the components in architecture of data center with diagram. Identify different fiber technologies. Understand the concept of dynamic multipoint virtual private network.

## **COURSE NAME: CLOUD COMPUTING AND UBIQUITOUS SYSTEM**

### **COURSE OUTCOME:**

**CO1:** Students are able to illustrate the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.

**CO2:** Students are able to investigate the resource virtualization technique for a given business case

**CO3:** Students learn to choose the appropriate file system and database for a given business case

**CO4:** Students are able to develop an algorithm for a given business case using Map-Reduce model

**CO5:** Students learn to build a SaaS solution for a real world problem with collaborative efforts

**CO6:** Students learn to identify the challenges in Cloud Management and Cloud Security.

## **COURSE NAME: ADVANCED DATABASE SYSTEMS**

### **COURSE OUTCOME:**

**CO1:** Students learn to differentiate between Entity Type and Entity Set. Draw an Extended Entity Relationship Model for any real world case study. Identify the constraints on Specialization and Generalization. Create customized user defined abstract data types to represent audio/video data.

**CO2:** Students are able to create object oriented database schema using constructs like Object identity, Object Structure, type constructors, Type hierarchies and Inheritance in Oracle and fire queries on the Complex objects using OQL.

**CO3:** Students are able to construct ORDBMS in Oracle consisting of Nested relations and collections. Perform Query processing and Optimization using SQL3. Comparative study of RDBMS, OODBMS and ORDBMS.

**CO4:** Students are able to fragment the given relationships/table horizontally and vertically implementing the concept of Parallel and Distributed Databases. Perform replication on the given data set using triggers and links in Oracle. Create an active database with triggers for add, update and delete.

**CO5:** Students are able to create and implement XML and Temporal databases using any database tool. Demonstrate the usage of enhanced Databases like GIS for advanced applications.

## **MASTER OF SCIENCE (INFORMATION TECHNOLOGY) SEM III**

### **PROGRAMME CODE: S01113**

## **COURSE NAME: EMBEDDED SYSTEMS**

### **COURSE OUTCOME:**

**CO1:** Students learn to define an embedded system with examples.

**CO2:** Students learn to differentiate between an Embedded System application and a General purpose computer.

**CO3:** Students understand the components in the making of an embedded system.

**CO4:** Students understand the characteristics of an embedded systems application in general

**CO5:** Students understand the steps for creating and embedded system in accordance to EDLC framework.

**CO6:** Students are able to identify different approaches for modelling and Embedded System application

**CO7:** Students learn tools Embedded Systems hardware and firmware Development.

**CO8:** Students learn Operating Systems concepts with respect to Embedded Systems and learn about Real Time Embedded Operating Systems.

**CO9:** Students understand the Memory related basic concepts like: memory types, memory hierarchy, mapping, caching,

**CO10:** Students understand Memory architecture for different types of memory

**CO11:** Students gain knowledge of how a memory sub system required for an embedded system can be designed

**CO12:** Students gain knowledge of different ways of Embedded Systems Programming like Assembly, C/C++, Java

**CO13:** Students learn the steps in creation of final code (hex file) to be run on embedded platform

**CO14:** Students understand different program elements in languages C/ Java.

**CO15:** Students learn the trends and challenges in Embedded System Industry with respect to embedded systems processor, operating system and development languages.

**CO16:** Students learn the architecture of AVR, ATMEL and PIC Family of microcontrollers.

## **COURSE NAME: INFORMATION SECURITY MANAGEMENT**

### **COURSE OUTCOME:**

**CO1:** Students understand how to keep information secure

**CO2:** Students understand the use of different types of keys to encrypt and decrypt a message

**CO3:** Students learn what is the use of encryption and decryption is

**CO4:** Students understand how to recover from a disaster and what measures are to be taken

**CO5:** Students learn what is forensic science and process of forensic science

**CO6:** Students learn specifying and enforcing security policies

**CO7:** Students understand what is audit and why it is done

## **COURSE NAME: ARTIFICIAL NEURAL NETWORKS**

### **COURSE OUTCOME:**

**CO1:** Students understand the brain metaphor

**CO2:** Students learn to write down the detail about perceptron's

**CO3:** Students understand support vector machine

**CO4:** Students understand Dynamic system review

**CO5:** Students learn evolutionary algorithm

## **COURSE NAME: ETHICAL HACKING**

### **COURSE OUTCOME:**

**CO1:** Students learn the types of Hackers, Perform Foot printing on any website using tools like Smartwhois, scan, sniff and enumerate the network using tools like nmap, superscanetc for finding open ports, vulnerable applications and insecure systems.

**CO2:** Students understand the Perform System Hacking to crack passwords, LM hashes using various tools like PwDump7, LCP, and Rainbow Crack etc. and learn the defenses against these attacks. Differentiate between and identify the telling signs of Trojans, Viruses and worms.

**CO3:** Students learn to recognize the different Social Engineering tactics used to launch attacks. Execute Denial of Service Attacks using HPing (Kali Linux) and web server attack using tools like HTTPRecon, IDServeetc; and the corresponding defenses.

**CO4:** Students learn to identify vulnerabilities in database by performing SQL injections using DVWA. Classify the different attacks launched on Mobile and wireless platforms and mitigate against these attacks.

**CO5:** Students learn to implement techniques for evasion and securing IDS, Firewall and other security devices. Use cryptographic techniques and tools like Truecrypt, BC4 etc. to secure sensitive data.

## **MASTER OF SCIENCE (INFORMATION TECHNOLOGY) SEM IV**

**PROGRAMME CODE: S01114**

### **COURSE NAME: ARTIFICIAL INTELLIGENCE**

#### **COURSE OUTCOME:**

**CO1:** Students understand the basics of the theory and practice of Artificial Intelligence as a discipline and about intelligent agents capable of problem formulation.

**CO2:** Students learn to evaluate different uninformed search algorithms on well formulated problems along with stating valid conclusions that the evaluation supports.

**CO3:** Students are able to design and Analysis of informed search algorithms on well formulated problems.

**CO4:** Students are able to formulate and solve given problem using Propositional and first order logic.

**CO5:** Students are able to analyze the AI problem using different planning techniques

**CO6:** Students understand various symbolic knowledge representations to specific multidisciplinary domains and reasoning tasks of a software agent.

### **COURSE NAME: IT INFRASTRUCTURE MANAGEMENT**

#### **COURSE OUTCOME:**

**CO1:** Students understand process, Functions and service strategy

**CO2:** Students understand service design

**CO3:** Students learn service transition

**CO4:** Students gain knowledge of Event Management, problem Management



**CO5:** Students are able to analyze continual process

### **COURSE NAME: COMPUTER FORENSICS**

#### **COURSE OUTCOME:**

**CO1:** Students understand data acquisition in detail

**CO2:** Students understand Processing crime and incident scenes

**CO3:** Students are able to compute the computer forensics analysis

**CO4:** Students learn to write in detail network forensic

**CO5:** Students learn to write the report writing on high tech investigations

### **COURSE NAME: CLOUD MANAGEMENT**

#### **COURSE OUTCOME:**

**CO1:** Students learn the types of cloud infrastructures and service provider

**CO2:** Students understand the working of storage network design

**CO3:** Students understand the importance of hybrid storage network technologies

**CO4:** Students are able to work with System center 2012

**CO5:** Students gain knowledge of managing Hyper-V environment with SCVMM 2012

**CO6:** Students understand provisioning self -service with App controller

**CO7:** Students learn to use data protection manager for backup and recovery?

**CO8:** Students learn to use Orchestrator for automation-

**CO9:** Students learn to implement Windows Azure pack

**CO10:** Students understand the concept of managing private cloud with App controller.