

Scheme

Semester – I

Code	Theory Paper	External	Internal	Total
MPCS 101	Research methodologies	80	20	100
MPCS 102	Elective -I	80	20	100
	Total	160	40	200

Semester – II

Code	Theory Paper	External	Internal	Total
MPCS 201	Elective -II	80	20	100
	Dissertation (Accepted /rejected) No Marks			
	Total	80	20	100

Elective –I

- a) Advance networking and security system
- b) Datamining and Data Warehouse

Elective –II

- a) Software Technologies
- b) Web technologies

SOSMPCS-01 RESEARCH METHODOLOGIES

Course Content:

1 Research Overview

Meaning of Research – Objectives of Research – Motivation in Research – Types of Research – Research Approaches – Significance of Research – research Methods versus Methodology – Research and Scientific Method – Importance of Knowing How Research is done – Research Process – Criteria of good Research – Necessity of Defining the Problem – Technique involved in Defining the Problem – Meaning of Research Design – Need for Research Design – Features of a Good Design – Important Concepts Relating to Research Design – Different Research Design – Data

2 Data Analysis

- Mathematical and statistical analysis using software tools like MAT Lab, SPSS or free wares tools.
- Report writing and analyzed data representation - Significance of Report Writing – Different Steps in writing Report – Layout of the Research Report – Types of Reports – Oral Presentation – Mechanics of Writing a research Report – Precautions for Writing Research Reports.

3 Quality Research Strategies

- Building expertise in the areas of interest, generating the base content in the selected area, literature survey for research work- already done, being done by others and arriving at directions of research.
- Formulation of research title , development of criteria based research proposal , Presentation for the research proposal and review of the proposal base on the feedbacks by evaluation experts.
- Planning for the research work with outcomes/achievable and time targets. Research monitoring publication of research outcomes in referred journals. Documentation of research work to generate thesis with norms and standards.

REFERENCE:

1. "Thesis & Assignment Writing" By Anderson, Berny H. Dujrston, H. Pode, Wiley Eastern Ltd., New Delhi, 1970.
2. MAT LAB Programming By Y. Kirani Singh and B. B. Chaudhuri, PHI
3. Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education 2003.
4. Quantitative Data Analysis in Education: A Critical Introduction Using SPSS - By by Paul Connolly
5. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to algorithms" Prentice Hall 1990.
6. "Research Methodology" R. Panneerselvam, PHI, New Delhi 2005
7. Intelligent data analysis: an introduction

SOSMPCS ELECTIVE I

(A) ADVANCED NETWORKING AND SECURITY SYSTEM

Course Content:

1 Network Tools and Techniques

- Protocol layering, system design, multiple access, switching, scheduling, naming, addressing, routing, error control; flow control
- Traffic management – data link layer protocols
- Internet: concept, history, network layer, transport protocol UDP, TCP, Ipv4, Ipv6

2 Local Area Networks, Socket and Interprocess communication

- Topologies, access techniques, LAN, 802.11G wireless LANs.
- Application layer: DNS, Email, WWW, multimedia.
- TCP sockets, UDP sockets name and address conversion, IPv4 / Ipv6 interoperability - Socket programming.

- Posix IPC, system V IPC, Pipes, FIFO, Posix message queue,

- System V semaphore, RPC in Sun systems. Unix programming using IPe.

3 Classical Encryption, Block Cipher and the Data Encryption Standard

- Classical Encryption Techniques : Symmetric Cipher Model, Substitution Techniques, Transportation Techniques, Rotor Machines, Steganography.
- Simplified DES, Block Cipher Principles, The Data Encryption Standard
- Block Cipher Design Principles and Modes of Operation
- Advanced Encryption Standard : Evaluation Criteria , The AES Cipher

4 Contemporary Symmetric Ciphers and Confidentiality using Symmetric Encryption

- Triple DES, Blowfish, RC5,
- Characteristics of Advanced Symmetric Block Ciphers RC4 Stream Cipher.
- Placement of Encryption function, Traffic Confidentiality, Key Distribution, Random Number generation.

5 Introduction to Number Theory and Key Management

- Prime Numbers, Fermat's and Euler's Theorems, Testing for Primality,
- The Chinese Remainder Theorem, Discrete Logarithms.
- Key Management, Diffie-Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.
- Authentication applications – Electronic Mail Security, IP Security– Web Security – System Security : Intruders – Malicious Software - Firewalls

REFERENCE:

- Computer Networks, A.S. Tanenbaum, PHI, 4th ed, ISBN 81-7808-785-5
- Cryptography and Network Security Third Edition William Stallings
- Cryptography and Data Security Demming, D, Addison Wesley, 1982.
- Computer Networking A top down approach featuring the Internet, J.F.Kurose.

SOSMPCS DATA MINING AND DATA WAREHOUSE

Course Content:

1 Introduction: Fundamentals of data mining

- Data mining Functionalities,
- Classification of Data Mining Systems,
- Major issues in Data Mining,
- Data Warehouse and OLAP Technology for Data mining
- Data Warehouse, Multidimensional Data Model ,
- Data Warehouse Architecture, Data Warehouse implementation,
- Development of Data Cube Technology,

2 Data Preprocessing, Data Mining Primitives, Languages, and System Architectures

- Needs Preprocessing the Data,
- Data Cleaning, Data Integration and Transformation,
- Data Reduction, Discretization and Concept Hierarchy Generation.
- Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on Data Mining Query Language Architectures of Data Mining Systems.

3 Concepts Description and Mining Association Rules

- Characterization and Comparison: Data Generation and Summarization
- Bases characterization, Analytical Characterization: Mining Class Comparisons
- Association Rule Mining,
- Rules from Relational Databases and Data Warehouses

4 Classification , Prediction and Cluster Analysis Introduction

- Issues Regarding Classification and Prediction,
- Classification by Decision Tree , Classification by Backpropagation, Classification Based on Concepts from Association Rule Mining
- Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density , Based Methods
- Grid Based Methods, Model – Based Clustering Methods, outlier analysis. Multidimensional Analysis and Descriptive

5. Mining Complex Types of Data

- Mining of Complex, Data Objects, Mining Spatial Databases
- Mining Multimedia Databases
- Mining Time – Series and Sequence Data, Mining Text Databases,
- Mining the World Wide Web.

REFERENCE:

1. Data Mining - Concepts and Techniques - JIAWEIHAN & MICHELINE KAMBER Morgan Kaufmann publishers.
2. Data Mining Techniques – ARJUN K PUJARI, Universities Press.
3. Data Warehousing in the Real world SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.

SOSMPCS ELECTIVE II

(A) SOFTWARE TECHNOLOGIES

Course Content:

1. Software Management Concept

- Software process
- Software project Metrics
- Software project Planning
- Risk Management

2. Software Quality Assurance

Sr. SUBJECT

CODE

NAME OF THE

SUBJECT

Teaching Scheme Examination Scheme

Theory Practical Theory Practical/Viva

2 MPCS-05 Elective-II 1 2 100 50

- Quality Concepts
- Quality Movement
- Software Review
- Software Quality Assurance
- Formal Technical Reviews

3. Software Testing

- Software Testing Fundamentals
- Test Case Design
- Basic path Testing
- Control Structure Testing
- A Strategic approach to software

4. Enterprise Application Integration

- Concepts and challenges of integrating different application
- Different heterogeneous platform
- EAI architecture , EAI approaches data level
- Application / process level , method level

5. Messaging concepts and services

- Messaging concepts and various types of messaging services
- Middleware and adapter services , Transaction middle ware
- EAI process methodology

REFERENCES:

Software Engineering – Roger S.Pressman , fifth edition, Mc Graw hill.

SOSMPCS WEB TECHNOLOGIES

Course Content:

1 HTML ,DHTML and Scripting Language

- Common tags – HTML Tables and formatting internal
- linking – Complex HTML forms.
- Java Scripts – Control structures
- DHTML – CSS – event model – filters & transitions.

2 Applets and AWT Programming

- Review of Applets, Class, Event Handling,
- AWT Programming.
- Introduction to Swing: JApplet, Handling Swing Controls
- Tables, Differences between AWT Controls & Swing Controls
- Developing a Home page using Applets & Swing. Multi-Threading and RMI.

3 Java Beans and Servlets

- Introduction and Advantages of Java Beans
- BDK, Introspection, Using Bound properties, Bean Info Interface
- Constrained properties, persistence, Customizers, Java Beans API
- Life Cycle of a Servlet, JSDK, The Servlet API, The javax.servlet Package
- Reading Servlet parameters, Reading Initialization Parameters
- The javax.servlet HTTP package, Handling, Http Request & responses
- Using Cookies – Sessions Tracking, Security Issues.

4 JSP

- Introduction to JSP: The Problem with Servlets, The Anatomy of a JSP Page,
- JSP Processing, JSP Application Design with MVC. Tomcat Server & Testing Tomcat.
- JSP Application Deployment

5 JDBC

- Database Access, Database Programming using JDBC,
- Studying javax.sql.* package.
- Accessing a Database from a JSP Page.

REFERENCE:

1. Internet and World Wide Web – How to program by Dietel, and Nieto Pearson Education Asia. (Chapters: 3,4,8,9,10,11,12-18).
2. The Complete Reference Java 2 third Edition by Patrick Naughton and Herbert Schildt. (Chapters: 19,20,,21,22,25,27).
3. Java Server Pages by Hans Bergstan. (Chapters: 1-9).