Jiwaji University, Gwalior – M.phil – Session 2014-15

Scheme

Semester – I

<table>
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<tr>
<th>Code</th>
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<tr>
<td>MPCS 101</td>
<td>Research methodologies</td>
<td>80</td>
<td>20</td>
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<td>MPCS 102</td>
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Semester – II

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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

2 Data Analysis
• Mathematical and statistical analysis using software tools like MAT Lab, SPSS or free wares tools.

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:
2MAT LAB Programming By Y. Kirani Singh and B. B. Chaudhuri, PHI
4. Quantitative Data Analysis in Education: A Critical Introduction Using SPSS - By by Paul Connolly
7. Intelligent data analysis: an introduction
SOS MPCS 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
- Simplified DES, Block Cipher Principles, The Data Encryption Standard
- Block Cipher Design Principles and Modes of Operation

4 Contemporary Symmetric Ciphers and Confidentiality using Symmetric Encryption
- Triple DES, Blowfish, RC5,
- Characteristics of Advanced Symmetric Blick 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 Chainese Remainder Theorem, Discrete Logarithms.

REFERENCE:
- 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.
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.
REFERENCES:
1. Data Mining - Concepts and Techniques - JIAWEIHAN & MICHELINE KAMBER Morgan Kaufmann publishers.
2. Data Mining Techniques – ARJUN K PUJARI, Universities Press.
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 Fundaments
   • 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 aware
   • EAI process methodology

REFERENCES:
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

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).