With effect from the academic Year 2018-19

SCHEME OF INSTRUCTION
MCA (MASTER OF COMPUTER APPLICATIONS)
Proposed scheme with effect from the academic year 2018-2019
Semester - V

<table>
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<th>Scheme of Instruction</th>
<th>Contact Hrs/Wk</th>
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Practicals

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Total 15 5 08 28 225 450 20

Professional Elective-II
PE 510 IT  Electronic Commerce
PE 511 IT  Human Computer Interaction
PE 512 IT  Software Reuse Techniques
PE 513 IT  XML &Web Services
PE 514 IT  Cloud Computing
PE 515 IT  System Administration

Professional Elective-III
PE 516 IT  Soft Computing
PE 517 IT  Mobile Computing
PE 518 IT  Software Project Management
PE 519 IT  Rich Internet Applications
PE 520 IT  Software Quality and Testing
PE 521 IT  Research Methodology
PC 501 IT       INFORMATION SECURITY  
Credits: 3

Instruction: (3L+ 1L) hrs per week  
CIE: 30 marks  
Duration of SEE: 3 hours  
SEE: 70 marks

UNIT-I

UNIT-II
Legal, Ethical and professional Issues: Law and ethics in information security, Relevant U.S laws-international laws and legal bodies, Ethics and information security.
Risk Management: Overview, Risk identification, Risk assessment, Risk control strategies, selecting a risk control strategy, Quantitative versus qualitative risk control practices, Risk management discussion points, Recommended risk control practices.

UNIT-III
Security Technology: Firewalls and VPNs, Physical design, Firewalls, Protecting remote connections

UNIT-IV
Security Technology: Intrusion detection, access control and other security tolls: Intrusion detection and prevention systems, Scanning and analysis tools, Access control devices.

UNIT- V

Suggested Reading:
With effect from the academic Year 2018-19

PC 502 IT  OBJECT ORIENTED SYSTEM DEVELOPMENT  
Credits: 3

Instruction: (3L + 1T) hrs per week  
CIE: 30 marks

Duration of SEE: 3 hours  
SEE: 70 marks

UNIT – I


Advanced Structural Modeling: Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages, Instances, Object Diagrams, Components.

UNIT – II


Advanced Behavioral Modeling: Events and signals, State Machines, Processes and Threads, Times and space, State Chart Diagrams.

UNIT – III


UNIT – IV


UNIT – V

Core Workflows: Requirements Capture, Capturing Requirements as Use Cases, Analysis, Design, Implementation, Test.

Suggested Reading:

PC 503 IT             BIG DATA ANALYTICS
Credits: 3

Instruction: (3L + 1T) hrs per week       Duration of SEE: 3 hours
CIE: 30 marks                    SEE: 70 marks

UNIT – I:
Getting an overview of Big Data: Introduction to Big Data, Structuring Big Data, Types of Data, Elements of Big Data, Big Data Analytics, Advantages of Big Data Analytics.

UNIT – II:
Understanding Hadoop Ecosystem: Introducing Hadoop, HDFS and MapReduce, Hadoop functions, Hadoop Ecosystem.
Hadoop Distributed File System- HDFS Architecture, Concept of Blocks in HDFS Architecture, Namenodes and Datanodes, Features of HDFS, MapReduce.
Introducing HBase - HBase Architecture, Regions, Storing Big Data with HBase, Combining HBase and HDFS, Features of HBase, Hive, Pig and Pig Latin, Sqoop, ZooKeeper, Flume, Oozie.

UNIT – III:
Understanding MapReduce Fundamentals and HBase: The MapReduce Framework, Exploring the features of MapReduce, Working of MapReduce, Techniques to optimize MapReduce Jobs, Hardware/Network Topology, Synchronization, File system, Uses of MapReduce, Role of HBase in Big Data Processing- Characteristics of HBase.

UNIT – IV:
Storing Data in Databases and Data Warehouses: RDBMS and Big Data, Issues with Relational Model, Non – Relational Database, Issues with Non Relational Database, Polyglot Persistence, Integrating Big Data with Traditional Data Warehouse, Big Data Analysis and Data Warehouse.

UNIT – V:
NoSQL Data Management: Introduction to NoSQL, Characteristics of NoSQL, History of NoSQL, Types of NoSQL Data Models- Key Value Data Model, Column Oriented Data Model, Document Data Model, Graph Databases, Schema-Less Databases, Materialized Views, CAP Theorem.

Suggested Reading:

With effect from the academic Year 2018-19

PE 510 IT  E- COMMERCE

Credits: 3

Instruction: (3L +1T) hrs per week  Duration of SEE: 3 hours
CIE: 30 marks  SEE: 70 marks

UNIT - I

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.
Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT - II

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.
Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

UNIT - III

Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT- IV

Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.
Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

UNIT - V

Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processing, Desktop video conferencing.

TEXT BOOK:
2. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Elizabeth Chang, John Wiley.
PE 511 IT HUMAN COMPUTER INTERACTION

Credits: 3

Instruction: (3L + 1L) hrs per week
CIE: 30 marks
Duration of SEE: 3 hours
SEE: 70 marks

UNIT- I


UNIT- II

Discovery: Discovery Phase Framework, Collection, Interpretation, Documentation

UNIT- III

Interaction Design Models: Model Human Processor, Keyboard Level Model, GOMS, Modeling Structure, Modeling Dynamics, Physical Models
Usability Testing: Usability, Usability Test, Design the Test, Prepare for the Test, Perform the Test, Process the Data

UNIT- IV

Interface Components: The WIMP Interface, Other Components

UNIT- V

Speech and Hearing: The Human Perceptual System, Using Sound in Interaction Design, Technical Issues Concerning Sound
Suggested Reading:

PE 512 IT  SOFTWARE REUSE TECHNIQUES

Credits: 3

Instruction: (3L + 1L) hrs per week  Duration of SEE: 3 hours
CIE: 30 marks  SEE: 70 marks

UNIT-I
Software reuse success factors, Reuse driven software engineering business, Object oriented software engineering, applications and component sub systems, use case components, object components.

UNIT-II
Design Patterns – Introduction, Creational patterns, factory, factory method, abstract factory, singleton, builder prototype.

UNIT-III
Structural Patterns- Adapters, bridge, composite, decorator, façade, flyweight, proxy.
Behavioral Patterns – Chain of responsibility, command, and interpreter.

UNIT-IV
Behavioral Patterns – Iterator, mediator, memento, observer, state, strategy, template, visitor, other, design patterns- Whole part, master- slave, view handler, forwarder- receiver, client – dispatcher- server, publisher – subscriber.

UNIT-V

Suggested Reading:
3. Frank Buschmann etc. – Pattern Oriented Software Architecture – Volume 1, Wiley 1996.
With effect from the academic Year 2018-19

PE 513 IT  XML AND WEB SERVICES

Credits: 3

Instruction: (3L +1L) hrs per week  Duration of SEE: 3 hours
CIE: 30 marks  SEE: 70 marks

UNIT- I :


UNIT- II :

XML Technology : XML Technology, XML - Name Spaces - Structuring With Schemas and DTD - Presentation Techniques - Transformation - XML Infrastructure.

UNIT- III:


UNIT- IV:

WEB Services: Overview - Architecture - Key Technologies - UDDI - WSDL - ebXML - SOAP And Web Services In E-Com - Overview Of .NET And J2EE.

UNIT- V:


Suggested Reading:

With effect from the academic Year 2018-19

PE 514 IT                  CLOUD COMPUTING
                          Credits: 3

Instruction : 3L hrs per week            Duration of SEE : 3 hours

CIE : 30 Marks                    SEE : 70 Marks

Unit- I

Introduction, Benefits and challenges, Cloud computing services, Resource Virtualization, Resource pooling sharing and provisioning

Unit -II

Scaling in the Cloud, Capacity Planning, Load Balancing, File System and Storage,

Unit-III


Unit-IV

Portability and Interoperability Issues, Cloud Management and a Programming Model Case Study, Popular Cloud Services

Unit- V


Suggested Reading:


PE 515 IT  
SYSTEM ADMINISTRATION  

Credits: 3

Instruction: (3L +1L) hrs per week  
Duration of SEE: 3 hours

CIE: 30 marks  
SEE: 70 marks

UNIT- I

Functions of system administration, UNIX: Files, Processes Devices, file system, essential administrative tools: Grep, awk, files and directory commands, starting and shutdown process.

UNIT- II

User accounts, security, managing system resources : System performance, managing CPU usage, memory, disk I/O automating tasks with scripts.

UNIT- III

File system and Disks: Mounting, adding disks, CD-Rom devices, and backup and restore terminals modems and printers.

UNIT- IV

TCP/IP Network Management: TCP/IP networking, adding a new host, NFS/NIS, monitoring the network, E-mail, configuring and building Kernel for Linux.

UNIT- V

Database administration skills covering installation, configuration and tuning a database, administering servers and server groups, managing and optimizing schemas, tables, indexes, and views, creating logins, configuring permissions, assigning roles and performing other essential security tasks, backup and recovery strategies, automation and maintenance.

Suggested Readings:

PE 516 IT                      SOFT COMPUTING

Credits: 3

Instruction: (3L + 1L) hrs per week
CIE: 30 marks

Duration of SEE: 3 hours
SEE: 70 marks

UNIT-I
Fundamentals of Neural Networks: Basic Concepts of Neural Networks, Human Brain, Model of an Artificial Neuron, Neural Network Architectures, Characteristics of Neural Networks, Learning Methods, Taxonomy of Neural Network Architectures, History of Neural Network Research, Early Neural Network Architectures, Some Application Domains.

UNIT-II

UNIT-III
Fuzzy Set Theory: Fuzzy Versus Crisp, Crisp Sets, Fuzzy Sets, Crisp Relations, Fuzzy Relations.

UNIT-IV
Genetic Modeling: Inheritance Operators, Cross Over, Inversion, And Deletion, Mutation Operator, Bit-Wise Operators, Bit-Wise Operators used in GA, Generational Cycle, Convergence of Genetic Algorithms, Applications, Multi-Level Optimization, Real Life Problem, Differences and Similarities Between GA and Other Traditional Methods, Advances in GA.

UNIT-V
Integration of Neural Networks, Fuzzy Logic and Genetic Algorithms: Hybrid Systems, Neural Networks, Fuzzy Logic, and Genetic Algorithms Hybrids, Preview of Hybrid Systems
Genetic Algorithms Based Back propagation Networks: Ga Based Weight Determination, Applications.

Suggested Reading:
PE 517 IT MOBILE COMPUTING Credits: 3

Instruction: (3L+1L) hrs per week Duration of SEE: 3 hours
CIE: 30 marks SEE: 70 marks

UNIT-I


UNIT-II

**Telecommunication Systems:** GSM, GPRS, Satellite Networks, Basics, Parameters and Configurations, Capacity Allocation, FAMA and DAMA, Broadcast Systems, DAB, DVB, CDMA and 3G.

UNIT-III

**Wireless LAN:** IEEE 802.11 Architecture, Services, MAC – Physical Layer, IEEE 802.11a – 802.11b standards, Bluetooth.

UNIT-IV


**Mobile IP - Dynamic Host Configuration Protocol.**

**Traditional TCP - Classical TCP Improvements – WAP, WAP 2.0.**

UNIT-V

**Publishing & Accessing Data in Air:** Pull and Push Based Data Delivery models, Data Dissemination by Broadcast, Broadcast Disks, Directory Service in Air, Energy Efficient Indexing scheme for Push Based Data Delivery.

**File System Support for Mobility:** Distributed File Sharing for Mobility support, Coda and other Storage Manager for Mobility Support.

**Mobile Transaction and Commerce:** Models for Mobile Transaction, Kangaroo and Joey transactions, Team Transaction, Recovery Model for Mobile Transactions, Electronic Payment and Protocols for Mobile Commerce.

**Suggested Reading:**
PE 518 IT SOFTWARE PROJECT MANAGEMENT
Credits: 3

Instruction: (3L+1L) hrs per week
CIE: 30 marks
Duration of SEE: 3 hours
SEE: 70 marks

UNIT-I

UNIT-II
Life – Cycle phases, Artifacts of the process, Model Based Software Architectures, Workflows of the Process, Checkpoints of the process.

UNIT-III

UNIT-IV
Modern Project profiles, Next Generation Software Economics, Modern process Transitions, Managing Contacts, Managing People & Organizing Terms.

UNIT-V
Process improvement & mapping to the CMM, ISO 12207 – an overview, programme management.

Suggested Reading:
PE 519 IT  
**RICH INTERNET APPLICATIONS**  
*Credits: 3*

**Instruction:** (3L+1L) hrs per week  
**Duration of SEE:** 3 hours  
**CIE:** 30 marks  
**SEE:** 70 marks

**UNIT-I**  
Web 2.0 Folksonomies and Web 2.0, Software as a service. Multiple delivery channels (Voice – VOXML, and ANT (HTML), Social Networking.

**UNIT - II**  
Client side programming – Overview of Java Script, Objects in Java Script, Regular expressions, Overview of XML, DTD and XML Schema, DOM and SAX Parsers, CSS, XSLT.

**UNIT- III**  
Web Services- SOA, SOAP, WSDL, REST Services.  
JSON Format- Ajax introduction, XML HTTP object comparison with I frames.

**UNIT-IV**  
Building Rich Internet Application- Flash Player, Flex framework, MXML introduction, Action Script Introduction, working with Action Script, Flex Data binding, Common UI Components using Datagrids. Tree controls, Pop up controls etc.

**UNIT-V**  

**Suggested Reading:**  
PE 520 IT  SOFTWARE QUALITY AND TESTING  
Credits: 3

Instruction: (3L + 1L) hrs per week
CIE: 30 marks
Duration of SEE: 3 hours
SEE: 70 marks

UNIT-I


UNIT - II

Quality tools in Software Development, Seven Basic Tools, Check List, Pareto Diagram, Histogram, Run Charts, Scatter Diagram, Control Chart, Cause and Effect Diagram, Defect Removal, Effect Removal Effectiveness, Quality Planning, Cost Effectiveness of Phase Effect Removal.

UNIT – III


UNIT - IV


UNIT - V

Planning Your Test Effort, Writing and Tracking Test Cases, Reporting Measuring SQA.

Suggested Reading:

PE 521 IT RESEARCH METHODOLOGY

Credits: 3

Instruction: (3L) hrs per week

CIE: 30 marks

Duration of SEE: 3 hours

SEE: 70 marks

UNIT-I


Defining the Research Problem: Definition of Research Problem, Problem Formulation, Necessity of Defining the Problem, Technique Involved in Defining a Problem.

UNIT-II

Literature Survey: Importance of Literature Survey, Sources of Information, Assessment of Quality of Journals and Articles, Information through Internet.


UNIT-III


UNIT-IV


Data Analysis: Deterministic and random data, uncertainly analysis, tests for significance: Chi-square, student’s ‘t’ test Regression modeling, direct and interaction effects. ANOVA, F-test, Time Series analysis, Autocorrelation and autoregressive modeling.
UNIT-V:


**Suggested Reading:**

1. C.R.Kothari, Research Methodology, Methods & Technique; New age International Publishers, 2004
2. R.Ganesan; Research Methodology for Engineers; MJP Publishers; Chennai, 2011.
3. Y.P.Agawal; Statistical Methods; Concepts, Application and Computation; Sterling Publishers Pvt. Ltd; New Delhi; 2004
4. Dr.Vijay Upagade and Dr.Aravind Shende, Research Methodology, S.Chand & Company Ltd., New Delhi; 2009.
5. P.Ramdass and A Wilson Aruni; Research and Writing across the disciplines; MJP Publishers;
PC 551 IT  OBJECTORIENTEDSYSTEMSDESIGNLAB
Credits: 2

Instruction: (2 P) hrs per week
CIE: 25 marks

Duration of SEE: 3 hours
SEE: 50 marks

Students have to perform the following OOAD steps on a given

Prepare the following documents for each experiment and develop the
software using software Engineering methodology

1. Problem Analysis and Project Planning - Thorough study of the problem –
Identify Project scope, Objectives and Infrastructure.

2. Software Requirement Analysis - Describe the individual Phases/modules of the
   project and Identify deliverables.

3. Data Modelling - Use work products - data dictionary, use case diagrams
   and activity diagrams, build and test class diagrams, sequence diagrams and
   add interface to class diagrams.

4. Software Development and Debugging - implement the design by coding

5. Software Testing - Prepare test plan, perform validation testing, coverage
   analysis, memory leaks, develop test case hierarchy, Site check and site
   monitor

Sample Experiments:

Academic domain
1. Course Registration System
2. Student marks Analyzing System

Railway domain
3. Online ticket reservation system
4. Platform assignment system for the trains in a railway station

Medicine domain
5. Expert system to prescribe the medicines for the given symptoms
6. Remote computer monitoring

Finance domain
7. ATM system
8. Stock maintenance

Human Resource Management
9. Quiz System
10. E-mail Client system

SOFTWARE REQUIRED:
Open source Tools: StarUML / UMLGraph / Topcased
PC 552 IT  
BIG DATA ANALYTICS LAB  
*Credits: 2*

*Instruction: (2 P) hrs per week*  
*Duration of SEE: 3 hours*  
*CIE: 25 marks*  
*SEE: 50 marks*

1. (i) Perform setting up and Installing Hadoop in its three operating modes:
   - Standalone,
   - Pseudo distributed,
   - Fully distributed
   (ii) Use web based tools to monitor your Hadoop setup.

2. Implement the following file management tasks in Hadoop:
   - Adding files and directories
   - Retrieving files
   - Deleting files

3. Run a basic Word Count Map Reduce program to understand Map Reduce Paradigm.

4. Write a Map Reduce program that mines weather data. Weather sensors collecting data every hour at many locations across the globe gather a large volume of log data, which is a good candidate for analysis with MapReduce, since it is semi structured and record-oriented.

5. Implement Matrix Multiplication with Hadoop Map Reduce

6. Install and Run Pig then write Pig Latin scripts to sort, group, join, project, and filter your data.

7. Install and Run Hive then use Hive to create, alter, and drop databases, tables, views, functions, and indexes.
PC 553 IT                       PROJECT SEMINAR

Instruction: (2P) hrs per week
CIE: 25 Marks

Oral presentation is an important aspect of technical education. The objective of the Seminar Course is to motivate a student to do a systematic and independent study of state-of-topics in a board area of his/her interest.

Seminar topics may be chosen by the student with the suggestions from the family members. Students are to be exposed to following aspects of seminar presentation.

Students are to be exposed to following aspects of seminar presentations.

- Literature survey
- Organization of material to be presented
- Preparation of power point Presentation
- Technical writing

Each student is required to

1. Submit one page synopsis of the seminar talk for display on notice board of the department.
2. Give a 20 minutes presentation with the aid of a PC, followed by a 10 minutes discussion.
3. Submit the report on the seminar topic presented along with list of reference and slides used.

Seminar is to be scheduled from the third week to the last week of the semester and any change in schedule should be discouraged.

CIE marks will be awarded jointly or independently by at least two faculty members. The award will be on the basis of the oral presentation made, written materials submitted, active participation of the student in the proceedings as well as involvement in the discussions.