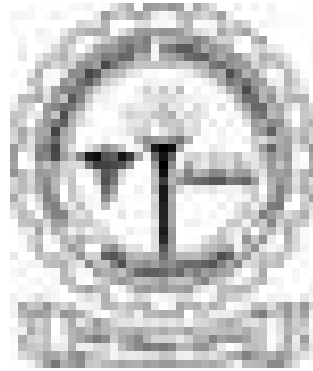


BHAGWANT UNIVERSITY
Sikar Road, Ajmer
Rajasthan



Syllabus

Institute of Computer Application

M. Phil

(Computer Application)

Institute of Computer Application

M. Phil. - Computer Application

SEMESTER-I

Subject code	Subject Name	Teaching hours			Marks		
		L	T	P	External	Internal	Total
01MPCA101	Research Methodology Theory And Techniques	3	0	0	70	30	100
01MPCA102	Data Warehousing and Data Mining	3	0	0	70	30	100
01MPCA103	Web Technologies and Services	3	0	0	70	30	100
01MPCA104	Digital Image Processing and Multimedia	3	0	0	70	30	100
Total		12	0	0	280	120	400

SEMESTER-II

Subject code	Subject Name	Teaching hours			Marks		
		L	T	P	External	Internal	Total
02MPCA101	Advanced Research Methodology	3	0	0	70	30	100
02MPCA102	Wireless Technology	3	0	0	70	30	100
02MPCA103	Advanced Database System	3	0	0	70	30	100
02MPCA201	Dissertation	0	0	3	100	0	100
Total		12	0	0	310	90	400

PAPER I: 01MPCA101

RESEARCH METHODOLOGY THEORY AND TECHNIQUES

Unit-I: 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

Unit-II: Research design

Meaning of Research Design – Need for Research Design – Features of a Good Design – Important Concepts Relating to Research Design – Different Research Design – Data

Unit-III: 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.

Unit-IV: 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.

Unit-V: Research Proposal

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.

PAPER II: 01MPCA102

DATA MINING AND DATA WAREHOUSING

Unit-I: 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 iMPCAementation,
- Development of Data Cube Technology,

Unit-II: 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.

Unit-III: 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

Unit-IV: 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

Unit-V: Mining CoMPCAex Types of Data

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

PAPER III: 01MPCA103

WEB TECHNOLOGIES AND SERVICES

Unit-I : HTML ,DHTML and Scripting Language

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

Unit-II: 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.

Unit-III: Java Beans and Servlets

- Introduction and Advantages of Java Beans
- JDK, 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.

Unit-IV: 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

Unit-V: JDBC (Java Database Connectivity)

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

PAPER IV: 01MPCA104

DIGITAL IMAGE PROCESSING AND MULTIMEDIA

Unit-I

Digital image fundamentals

Introduction: Digital Image- Steps of Digital Image Processing Systems-Elements of Visual Perception -

Connectivity and Relations between Pixels. SiMPCAe Operations- Arithmetic, Logical, Geometric Operations.

Mathematical Preliminaries - 2D Linear Space Invariant Systems - 2D Convolution - Correlation
2D Random Sequence - 2D Spectrum.

Unit-II

Image transforms and enhancement

Image Transforms: 2D Orthogonal and Unitary Transforms-Properties and ExaMPCAs. 2D
DFT- FFT – DCT -

Hadamard Transform - Haar Transform - Slant Transform - KL Transform -Properties and
ExaMPCAs. Image

Enhancement:- Histogram Equalization Technique- Point Processing-Spatial Filtering-In Space
And Frequency -Nonlinear Filtering-Use of Different Masks.

Unit-III

Image restoration and construction

Image Restoration: Image Observation And Degradation Model, Circulant And Block Circulant
Matrices and Its Application In Degradation Model - Algebraic Approach to Restoration- Inverse
By Wiener Filtering – Generalized Inverse-SVD And Interactive Methods - Blind
Deconvolution-Image Reconstruction From Projections.

Unit-IV

Image compression & segmentation

Image Compression: Redundancy And Compression Models -Loss Less And Lossy.

Loss Less- Variable-Length, Huffman, Arithmetic Coding - Bit-Plane Coding, Loss Less
Predictive Coding, Lossy Transform (DCT) Based Coding, JPEG Standard - Sub Band Coding.

Image Segmentation: Edge Detection - Line Detection - Curve Detection - Edge Linking and
Boundary Extraction, Boundary Representation, Region Representation and Segmentation,
Morphology-Dilation, Erosion, Opening and Closing. Hit and Miss Algorithms Feature Analysis

Unit-V

Color and multispectral image processing

Color Image-Processing Fundamentals, RGB Models, HSI Models, Relationship Between
Different Models.

Multispectral Image Analysis - Color Image Processing Three Dimensional Image Processing-
Computerized Axial Tomography-Stereometry-Stereoscopic Image Display-Shaded Surface
Display.

References

1 Digital Image Processing, Gonzalez.R.C & Woods. R.E., 3/e, Pearson Education, 2008.

2. Digital Image Processing, Kenneth R Castleman, Pearson Education, 1995.
3. Digital Image Processing, S. Jayaraman, S. Esakkirajan, T. Veerakumar, McGraw Hill Education, 2009.
Pvt Ltd, New Delhi
4. Fundamentals of Digital image Processing, Anil Jain.K, Prentice Hall of India, 1989.
5. Image Processing, Sid Ahmed, McGraw Hill, New York, 1995.

SEMESTER II

PAPER I: 02MPCA101

Advanced Research Methodology

UNIT I

Basic concepts: Research process, problem identification, research designs, informal experimental designs. Completing randomised design, randomized block design, latin square design, factorial designs

UNIT II

Sampling and testing of hypothesis: Concept of probability, probability distribution, Normal, Poisson, χ -square, t-test. Sampling distribution, central limit theorem, Sandler's A-test, standard error, population mean, population proportion, sample size, confidence intervals, null hypothesis and alternative hypothesis, level of significance, two tailed and one tailed tests, Z-test, t-test, χ^2 -test, F-test, testing of correlation coefficients, ANOVA one way ANOVA, two way ANOVA Tukey's HSD.

UNIT III

Non-parametric tests: Sign test, Fisher-Irwin test, Mc Nemer test, Wilcoxon Mali test, Wilcoxon, Mann-Whitney test, Kruskal-Wallis test, one sample runs test. Spearman's rank correlation, Kendall's coefficient of concordance.

UNIT IV

Multivariate analysis: Multiple regression, multiple discriminant analysis, multiple analysis of variance, canonical correlation analysis, Factor analysis cluster analysis, pathanalysis. Computational techniques.

UNIT V

Computer Application, Basic of Computer, System Software & application Software. Computer as a tool of Research: Application in data Analysis, related software. MS Office, SPSS, Data Communication, LAN & WAN Data Exploration using internet tools, e-journal, e- books, Basic concept of teleconferencing & related configuration

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References:

1. Kothari, C.R.(2004). Research Methodology: Methods and Techniques, New Age

International Publishers, New Delhi.

2. Arya., P.P. and Pal, Y.(2001) Research Methodology in Management: Theory and

Case Studies. Deep and Deep Publishers Pvt. Ltd., New Delhi.

Reference books :

1. Bedekar V. H. 1982 – How to write assignments, research papers, dissertations. Kanak New Delhi.

2. Barzham J. and Graff Henry, 1977- The Modern Researcher. Hercoust Brace. Javanavish Inc. 3rdEd.

3. Gatner, E. S. M. & F. Cardasco 1970 – Research and report writing, Pb. Bernes and Noble, N. Y.

4. Gibaldi pseph & Acheert Walters, 1981 – Modern Languaga Association Hand Book for Writers of Research paper – Affiliated East West press Pvt. Ltd.

5. Gupta S. P. 1978 Science and its methodology Ajanta pb.

6. Glick D. and Reschboam R. M. 1977 – Techniques of biological and biophysical methodology, J. Wilen & Sons, London

7. Salunkhe D. K. and Bapat D. R. 1984 – Preparation and Presentation of scientific publications ph. Registrar M. P. K. V. Rahuri.
8. R. Raman Nair : Computer application to library and information service 1992, E.S. S. Ess pb., New Delhi
9. M. L. Gillenson – Data base step by step, J. Wilen & Sons, 1990 N. Y.
10. P. V. S. Rao & P. Sadanandan (Ed.) – Modern trends in information technology 1988, Tata MacGrow Hill, pb.
11. Kothari C.K. (2004), 2/e, Research

PAPER II: 02MPCA102
Wireless Technology

UNIT I

Introduction of wireless communication :Overview ,frequencies for radio transmission ,evolution of cellular system ,cellular system Architecture and operation ,performance criteria ,Multiple access schemes for wireless communication-TDMA ,FDMA ,CDMA ,CSMA , SDMA.

UNIT II

Wireless network planning and operation ,frequencies management ,channel assignments ,frequency reuse ,system capacity and its improvement ,Handoffs and its types ,roaming,co-channel and adjacent channel interface.

Digital cellular network ,GSM architecture and interfaces ,Sig processing in GSM ,frame structure of GSM,Channels used in GSM.

UNIT III

Wireless LAN technology:Wireless WLAN technologies ,Infrared LAN's, spread spectrum LAN's ,Narrowband ,LAN'SIEEE802.11,architecture ,protocols ,MAC layer ,MAC frame ,MAC management.

UNIT IV

Bluetooth :overview ,architecture of Bluetooth system ,radio specifications, base band specifications ,link manager specification ,logical link control,adaptation protocol.

UNIT V

Mobile data network : Introduction ,data oriented CDPD NETWORKS ,wireless access protocol ,WAP architecture ,wireless datagram ,wireless datagram ,wireless transport layer security ,wireless transaction ,wireless session ,wireless application environment , WML

PAPER III: 02MPCA103

Advanced Database System

UNIT I

Transaction management and concurrency control : Transaction –evaluating transaction results ,transaction properties ,transaction Management with sql ,the transaction log ,concurrency controls ,with locking methods ,concurrency control with time stamping methods –wait/die and wound/wait schemes ,concurrency control with optimistic methods ,database recovery management.

Parallel database systems :concepts ,architecture of parallel databases ,inter-query and intra-query parallelism ,inter-operational and intra –operational parallelism ,design of parallel database systems.

UNIT II

Introduction to object based databases: Object oriented database concepts ,advantages ,OODBMS features ,groups and languages ,object relational database concepts and design.

Database performance tuning and query optimization : Database performance and tuning ,statistics ,query processing ,indexes and query optimization ,optimizer choices ,SQL performance tuning.

PL/SQL : concepts of embedded SQL ,dynamic SQL ,SQLJ ,PL/SQL ,concepts elements ,structures cursors ,triggers ,database stored procedures and SQL/PSM

UNIT III

Distributed database management systems: Evolution ,characteristics ,DDBMS components ,levels of data and process distribution (i.e . SPSD ,MPSD ,MPMD)

distributed transparency features ,DDBMS design data fragmentation ,data replication ,data allocation ,client /server vs DDBMS.

Introduction to data warehousing and data mining : Data warehouse –decision support ,architectural styles ,twelve rules that define a data warehouse ,data mining concepts ,OLAP concepts ,architecture relation ,OLAP v/s OLTP , star v/s clouding architecture .

UNIT IV

Database connectivity and web technologies ,database connectivity –Native SQL connectivity ,DBC ,DAO and RDO ,OLE –DB ,ADO NET ,Java database connectivity (JDBC) ,internet databases –web to database middlewar ,server side extensions ,web server interfaces ,the web browser ,client side extensions ,web application servers.

UNIT V

Database administration and security : the need for the role of a database in an organization ,the evolution of the database administration function :the database environments human components DBA’s managerial role ,The DBA’s technical role ,security –security policies ,security vulnerabilities ,database security ,database administration ,tools –the data dictionary ,developing a data administration strategy.

PAPER IV: 02MPCA201

Dissertation
