Syllabus Unitization & Prescribed Books (Session 2023-2024)

Department of CS & IT

Class-MSc IT-II Semester

Pattern of Question Paper - Eight questions of equal marks (Specified in the syllabus), two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Distributed Database

M. Marks: 100

Credits
L T P
4 0 0

Month wise Division	Syllabus Unitization
Jan-Feb	**SECTION–A** Introduction Concepts, Advantages and Disadvantages of Distributed Database Management System (DDBMS), Homogenous and Heterogeneous DDBMS. Functions of a DDBMS. Distributed Database Management System Architecture Architectural Models for DDBMS (Distributed Database Management System): Autonomy, Distribution, Heterogeneity factors; Client Server Systems, Peer-to-Peer Distributed Systems **SECTION–B** Distributed Relational Database Design Fragmentation: Reasons, Alternatives, Degree, Information requirement. Horizontal, Vertical, Hybrid Fragmentation. Allocation: Allocation Problem, Information Requirements for allocation.
March	**SECTION–C** Distributed Relational Database Query Processing & Optimization Query Decomposition, Localization of Distributed Data, Query Optimization, Introduction to Distributed Query Optimization Algorithms.
April	**SECTION–D** Distributed Concurrency Control, Objectives, Distributed Serializability, Centralized two-phase locking, Distributed two-phase locking.

Prescribed Book

Book Name – Principles of Distributed Database Systems

Author – M.Tamer Ozsu, Patrick Valdureiz

Publisher – Prentice Hall

FUZZY SYSTEMS

	Credits
M. Marks: 100	**L T P**
	4 0 0

Month wise Division	Syllabus Unitization
Jan-Feb	**SECTION–-A** Introduction The Case for Imprecision, A Historical Perspective, The Utility of Fuzzy Systems, Limitations of Fuzzy Systems . Classical Sets and Fuzzy Sets Classical Sets: Operations on Classical Sets, Properties of Classical (Crisp) Sets, Mapping of Classical Sets to Functions, Fuzzy Sets: Fuzzy Set Operations, Properties of Fuzzy Sets, Alternative Fuzzy Set Operations. **SECTION–-B** Classical Relations and Fuzzy Relations Cartesian Product, Crisp Relations: Cardinality of Crisp Relations, Operations on Crisp Relations, Properties of Crisp Relations, Composition, Fuzzy Relations: Cardinality of Fuzzy Relations, Operations on Fuzzy Relations, Properties of Fuzzy Relations, Fuzzy Cartesian Product and Composition, Tolerance and Equivalence Relations: Crisp Equivalence Relation, Crisp Tolerance Relation, Fuzzy Tolerance and Equivalence Relations: Value Assignments, Max–Min Method Properties of Membership Functions, Fuzzification, and Defuzzification Features of the Membership Function, Various Forms, Fuzzification, Defuzzification to Crisp Sets, λ-Cuts for Fuzzy Relations, Defuzzification to Scalars.
March	**SECTION–A** The Illusion: Ignoring Uncertainty and Accuracy, Uncertainty and Information, The Unknown, Fuzzy Sets and Membership, Chance Versus Fuzziness **SECTION–C** Logic and Fuzzy Systems Part I Logic: Classical Logic, Fuzzy Logic, Approximate Reasoning, Other Forms of the Implication Operation Part II Fuzzy Systems :Natural Language, Linguistic Hedges, Fuzzy (Rule-Based) Systems, Graphical Techniques of Inference Development of Membership Functions Membership Value Assignments: Intuition, Inference, Rank Ordering, Neural Networks, Genetic Algorithms, Inductive Reasoning. **SECTION–-D** Decision Making with Fuzzy Information Fuzzy Synthetic Evaluation, Fuzzy Ordering, Non-transitive Ranking, Preference and Consensus, Multiobjective Decision Making
April	**SECTION–D** Classification Classification by Equivalence Relations, Crisp Relations, Fuzzy Relations, Cluster Analysis, Cluster Validity, c-Means Clustering, Fuzzy c-Means (FCM), Fuzzy c-Means Algorithm Introduction to MATLAB: Fuzzy Logic Toolbox, Fuzzy Logic Simulink Demos . MATLAB simulation: Fuzzy Logic Controller (FLC) implementation. Simulink Fuzzy Logic Controller (FLC) implementation.Applications of FLC to Control System. Develop Fuzzy Inference System for various applications. .

Prescribed Book

Book Name – Fuzzy System

Author – Amandeep Singh

Publisher – Kalyani Publisher

Image processing

Month wise Division	Syllabus Unitization
Jan-Feb	**SECTION–-A** Introduction to Image Processing Systems, Digital Image Fundamentals:- Image model, Relationship between Pixels, Imaging geometry, Camera model. Manipulation on Images:- Images transformation : Introduction to FT, DFT and FFT. Walsh transformation, Hadamard transformation, Hotelling transformation, Histogram. Image Smoothing: - Neighborhood Averaging, Median Filtering, Low Pass Filters, Average of Multiple Images, Image Sharpening by Differentiation Technique, High Pass filtering. **SECTION–-B** Image Restoration: - Degradation models for continuous function, effect of diagonalization, ondegradation, algebraic approach to restoration, interactive restoration, Gray level interpolation.
March	**SECTION–-B** Image Encoding and Segmentation: - Encoding, Mapping, Quantizer and Coder. Segmentation: - Detection of discontinuation by point detection, line detection, edge detection. Edge linking and boundary detection:- Local analysis, global by graph, theoretic techniques. **SECTION–-C** Thresh-holding: - definition, global thresh-holding. Filtering**:**- median, gradient, simple method of representation signatures, boundary segments, skeleton of region. Image observation models, Inverse & Weiner fittening, FIR Weiner fitters, Fittening using Image transforms, Least square fitters, Generalized inverse, SVD & iterative methods.
April	**SECTION–-D** Spatial feature Extraction, Transform feature, Edge detection, Boundary extraction, Boundary Representation, Region representation, Moment representation. Structures Shape features, Texture, Seene matching & detection, Image Segmentation, Classification techniques, Image understanding.

Prescribed Book

Book Name – Digital Image processing

Author – Neeraj Anand

Publisher – Anand

Mobile Computing

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Credits

L T P

4 0 0

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M. Marks: 100

Month wise Division	Syllabus Unitization
Jan-Feb	**SECTION–A** Introduction: Current Wireless Systems: Overview of Paging Systems, Cordless Phones, Cellular Telephone Systems, Satellite Communication, Wireless LANs, Bluetooth. Modern Wireless Communication Systems 2G/2.5G/3G/4G Wireless Networks and Standards, Wireless in Local loop & LMDS Cellular Concepts Frequency spectrum, frequency reuse, channel assignment strategies, handoff strategies, interference and system capacity, fundamentals of antennas, Equivalent circuit for antenna, Antennas as cell site, Mobile antennas, Analog Vs Digital. **SECTION–B** Cellular Networks Mobile Radio Propagation, A basic cellular system, Performance criterion, Operations of Cellular Networks, Concept of frequency reuse Channels, Co channel Interference and it's reduction factor, types of non co channel Interference, Digital Modulation. Multi Access Technique & Wireless Standards
March	**SECTION–B** TDD, FDD, Rake receiver, CDD, Spread spectrum, (direct and frequency hopping) FDMA, TDMA, CDMA, Wireless Standards GSM, CDMA, DECT, UMTS & IMT-2000 **SECTION–C** WAP Model and architecture, Gateway, Protocol stack, Wireless Application environment Wireless LAN IEEE 802.11 Concepts, MAC Layer, Spread Spectrum Wireless LAN, Infrared Wireless LANs, Other Physical Layer Protocol (IEEE 802.11b, IEEE 802.11a), Wireless PAN (Bluetooth), HIPERLAN, Mobile Network Layer (Mobile IP), Mobile Transport Layer (Mobile TCP), Mobile Data network (GPRS),
April	**SECTION–D** GSM Systems Overview Architecture, Location tracking, and call setup. Security, Data Services N/W Signaling, GSMmobility management, Operations, Administration and maintenance. GSM bearer Services. SMS architecture-Protocol Hierarchy, Mobile prepaid phone services.

Prescribed Book

Book Name – Mobile Computing

Author – Gurjeet Singh

Publisher – Kalyani Publisher

Network Design and Performance Analysis

Month wise Division	Syllabus Unitization
Jan-Feb	**SECTION–-A** Requirements, planning, & choosing technology: Business requirements, technical requirement user requirements, traffic sizing characteristics time & delay consideration. Traffic engineering and capacity planning: Throughput calculation traffic characteristics & source models, traditional traffic engineering, queued data & packet switched traffic modeling, designing for peaks, delay or **SECTION–-B** Technology Comparisons- Generic packet switching networks characteristics, private vs. public networking, Business aspects of packet, frame and cell switching services, High speed LAN protocols comparison, Application performance needs, Throughput, burstiness, response time and delay tolerance, selecting service provider, vendor, service levels etc.
March	**SECTION–-C** Network performance modeling- creating traffic matrix, design tools, components of design tools, types of design projects. Access Network Design- N/W design layers, Access N/W design, access n/w capacity, Backbone n/w design, Backbone segments, backbone capacity, topologies, Tuning the network, securing the network,
April	**SECTION–-D** Design for network security. Network Optimization: Network optimization theory: Goals of network optimization, measurements for network optimization, optimization tools, optimization techniques.

Prescribed Book

Book Name – Data Network Design

Author – Darren Spohn

Publisher – McGraw-Hill Education (India) Pvt Limited