Integral University, Lucknow
Department of Computer Application

STUDY AND EVALUATION SCHEME

Master of Computer Application (MCA)

w.e.f. Session 2015-16

Year IInd Sem IVth

S. No	Subject Code	Subject	Periods			Evaluation Scheme				Subject Total
						Sessional			Exam	
			L	T	P	CT	TA	Total	ESE	
Theory Subjects										
1.	IMCA-401	Distributed System	3	1	0	25	25	50	100	150
2.	Elective-I	(any one of the following) *IMCA-402/(1)/ (2)/(3)/ (4)	3	1	0	25	25	50	100	150
3.	IMCA-403	JAVA Programming	3	1	0	25	25	50	100	150
4.	Elective-II	(any one of the following) *IMCA-404/(1)/ (2)/(3)/ (4)	3	1	0	25	25	50	100	150
5.	IMCA-405	Compiler Design	3	1	0	25	25	50	100	150
6.	IMCA-406	Computer Graphics and Animation	3	1	0	25	25	50	100	150
Labs										
7.	IMCA-471	Compiler Design Lab	0	0	3	25	25	50	50	100
8.	IMCA-472	JAVA Programming Lab	0	0	3	25	25	50	50	100
9.	IMCA-473	Computer Graphics Lab	0	0	2	15	10	25	25	50
10.	GP-401	General Proficiency	0	0	0	0	0	50	00	50
			18	**6**	**8**				**G. Total**	**1200**

Elective I

1. IMCA-402 (1) Data Warehousing and Data Mining
2. IMCA-402 (2) Cloud Computing
3. IMCA-402 (3) Big Data Analytics
4. IMCA-402 (4) Advanced Concepts in Database System

Elective II

1. IMCA-404 (1) Cryptography and Network Security
2. IMCA-404 (2) ERP Systems
3. IMCA-404 (3) Storage Technology and Management
4. IMCA-404 (4) Real Time Systems

IMCA-401 DISTRIBUTED SYSTEM

w.e.f. Session 2015-16

L	T	P
3	1	0

UNIT-I

Introduction to Distributed Systems: Introduction, System Architecture, Issues in Distributed System; Global Knowledge, Naming, Scalability, Compatibility, Process Synchronization, Security, Theoretical Foundation for Distributed Systems

Limitation Of Distributed Systems: Absence of Global Clock and Shared Memory, Lamport's Logical Clock, Vector Clocks, Causal Ordering of Messages, Global State, Termination Detection. [9]

UNIT-II

Distributed Mutual Exclusion: Introduction, Classification of Mutual Exclusion Algorithms, Requirement of Mutual Exclusion algorithms, Non-Token Based and Token based algorithms. Comparative Performance Analysis.

Distributed Deadlock Detection: System Model, Resource Vs Communication Deadlock, Deadlock Handling Strategies: Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Resolution, Centralized and Distributed Deadlock Detection algorithms. [9]

UNIT-III

Agreement Protocols: Introduction, System Model.

Classification Of Agreement Problem: Byzantine Agreement problem, Consensus problem, Interactive Consistency problem, Solution to Byzantine Agreement problem, Application of Agreement problem.

Distributed File Systems: Introduction, Architecture. Building Mechanism**:** Mounting Caching, Hints, Bulk Data Transfer, and Encryption. Design Issues: Naming and Name Resolution, Caches on Disk or Main Memory, Writing Policy. [9]

UNIT-IV

Distributed Shared Memory: Introduction, Architecture And Motivation, Algorithm for Implementing DSM, Memory Coherence, Coherence Protocols.

Distributed Scheduling: Issues in Load Distribution, Component of Load Distribution Algorithms, Load Distribution algorithms, Performance Comparison, Task Migration Introduction to Fault Tolerance, Data Security, Encryption, Multiprocessor Operating Systems. [9]

UNIT V

Distributed Algorithms: Introduction to Communication Protocols, Balanced Sliding Window Protocol, Routing Algorithms, Destination based Routing, APSP problem, Deadlock Free Packet Switching, Introduction to Wave and Traversal Algorithms, Election Algorithms. [8]

REFERENCES:

1. Singhal, Shivratri : “Advanced Concept Of Operating Systems”, TMH
2. Colourisis : “Distributed Systems”, Addison Wesley.

IMCA-402(1) DATA WAREHOUSING AND DATA MINING

w.e.f. Session 2015-16

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3	1	0

UNIT-I

Dss-Uses, Definition, Operational Database, Introduction to Data Warehousing, Data-Mart, Concept of Data-Warehousing, Multi Dimensional Database Structures, Client/Server Computing Model and Data Warehousing. Parallel Processors and Cluster Systems, Distributed DBMS Implementations. [8]

UNIT-II

Data Warehousing , Data Warehousing Components, Building a Data Warehouse, Warehouse Database, Mapping the Data Warehouse to a Multiprocessor Architecture, DBMS Schemas for Decision Support, Data Extraction, Cleanup and Transformation tools, Metadata. [8]

UNIT-III

Business Analysis, Reporting and Query Tools, Applications, Online Analytical Processing (OLAP), Patterns and Models, Statistics, Artificial Intelligence. [8]

UNIT-IV

Knowledge Discovery, Data Mining, Introduction to Data-Mining, Techniques of Data-Mining, Decision Trees, Neural Networks, Nearest Neighbor and Clustering, Genetic Algorithms, Rule introduction, Selecting and using the right technique. [8]

UNIT-V

Multimedia Data-Mining, Multimedia-Databases, Mining Multimedia Data, Data-Mining and the World Wide Web, Web Data-Mining, Mining and Meta-Data, Data Visualization and Overall Perspective, Data Visualization, Applications of Data-Mining [8]

REFERENCES:

1. Berson, “Data Warehousing, Data-Mining and OLAP”, TMH
2. Mallach, “Decision Support And Data Warehousing System”, TMH
3. Bhavani Thura-Is-Ingham, “Data-Mining Technologies, Techniques Tools and Trends”, CRC Press
4. Navathe, “Fundamental Of Database System”, Pearson Education
5. Margaret H. Dunham, “Data-Mining. Introductory and Advanced Topics”, Pearson Education
6. Pieter Adriaans, Dolf Zantinge, “Data-Mining”, Pearson Education

IMCA-402(2) CLOUD COMPUTING

w.e.f. Session 2015-16

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3	1	0

UNIT-I

Overview of Computing Paradigm: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing and Cloud Computing, Evaluation to Cloud Computing.

Introduction to Cloud Computing: Defining Cloud Computing

Cloud Types: The NIST Model, Cloud Cube Model, Deployment Models and Service Models.

Characteristics of Cloud Computing: Paradigm Shift, Benefits of Could Computing, Disadvantages of Cloud Computing, Assessing the Role of Open Standards. [8]

UNIT-II

Cloud Computing Architecture: Comparison with Traditional Computing Architecture (Client/Server), Cloud Computing Stack, Connecting to the Cloud.

Introduction to Service Models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), Defining Identity as a Service (IDaaS) and Defining Compliance as a Service (CaaS). [9]

UNIT-III

Abstraction and Virtualization: Virtualization and Cloud Computing, Types of Hardware Virtualization: Full, Partial, and Para.

Virtualization: Software Virtualization, Memory Virtualization, Storage Virtualization, Data Virtualization and Network Virtualization. Load Balancing, Abstraction technique using Hypervisors, Machine Imaging.

Capacity Planning: Defining Baseline and Metrics, Network Capacity, Scaling. [9]

UNIT-IV

Cloud Security: Cloud Security Fundamentals, Security Boundary, Security Service Boundary and Security Mapping.

Securing Data: Brokered Cloud Storage Access, Storage Location and Tenancy, Encryption, Auditing and Compliance.

Cloud Computing Security Architecture: Architectural Consideration: General Issues, Trusted Cloud Computing.

Establishing Identity and Presence: Identity Protocol Standards, Windows Azure Identity Standards and Presence. [8]

UNIT-V

Service Oriented Architecture (SOA): Introduction to SOA, Defining SOA Communications, Managing and Monitoring SOA, Relating SOA and Could Computing.

Cloud Based Storage: Measuring the Digital Universe, Provisioning Cloud Storage, Exploring Cloud Backup Solutions and Cloud Storage Interoperability. [8]

REFERENCES:

1. Barrie Sosinsky, “Cloud Computing Bible” , Wiley India, 2010
2. Rajkumar Buyya, James Broberg, Andrzej M. Goscinski ,“Cloud Computing: Principles and Paradigms”, Wiley, 2011
3. Nikos Antonopoulos, Lee Gillam , “Cloud Computing: Principles, Systems and Applications” , Springer, 2012
4. Ronald L. Krutz, Russell Dean Vines ,“Cloud Security: A Comprehensive Guide to Secure Cloud Computing”, , Wiley-India, 2010

IMCA-402 (3) BIG DATA ANALYTICS

w.e.f. Session 2015-16

	L	T	P
UNIT I	**3**	**1**	**0**

Introduction to Big Data : Introduction to Big Data Platform, Challenges of Conventional Systems , Intelligent data analysis ,Nature of Data, Analytic Processes and Tools, Analysis vs Reporting, Modern Data Analytic Tools, Statistical Concepts: Sampling Distributions, Re-Sampling, Statistical Inference, Prediction Error. [8]

UNIT II

Mining Data Streams : Introduction To Streams Concepts, Stream Data Model and Architecture , Stream Computing ,Sampling Data in a Stream , Filtering Streams, Counting Distinct Elements in a Stream , Estimating Moments , Real Time Analytics Platform(RTAP) Applications , Case Studies - Real Time Sentiment Analysis. [8]

UNIT III

Hadoop : History of Hadoop , Hadoop Distributed File System (HDFS) , Components of Hadoop , Analyzing the Data with Hadoop , Scaling Out , Hadoop Streaming ,Design of HDFS , Developing a Map Reduce Application , How Map Reduce Works , Anatomy of a Map Reduce job run , Job Scheduling , Shuffle and Sort , Task execution , Map Reduce Types and Formats , Map Reduce Features. [8]

UNIT IV

Hadoop Environment : Setting up a Hadoop Cluster , Cluster specification , Cluster Setup and Installation , Hadoop Configuration , Security in Hadoop , Administering Hadoop , Monitoring, Maintenance , Hadoop benchmarks , Hadoop in the cloud. [8]

UNIT V

Frameworks : Applications on Big Data Using Pig and Hive , Data processing operators in Pig , Hive services , HiveQL , Querying Data in Hive , Fundamentals of HBase and ZooKeeper , IBM InfoSphere Big Insights and Streams. Visualizations - Visual data analysis techniques, interaction techniques, Systems and applications. [8]

REFERENCES:

1. Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007.
2. Tom White “Hadoop: The Definitive Guide” Third Edition, O’reilly Media, 2012.
3. Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, Paul Zikopoulos, “Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data”, McGrawHill Publishing, 2012
4. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.

5. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, JohnWiley and sons, 2012.
6. Glenn J. Myatt, “Making Sense of Data”, John Wiley and Sons, 2007
7. Jiawei Han, Micheline Kamber “Data Mining Concepts and Techniques”, Second Edition, Elsevier, Reprinted 2008.
8. Da Ruan,Guoquing Chen, Etienne E.Kerre, GeertWets, Intelligent Data Mining, Springer,2007
9. Paul Zikopoulos ,Dirk deRoos , Krishnan Parasuraman , Thomas Deutsch , James Giles , David Corrigan , Harness the Power of Big Data The IBM Big Data Platform, Tata McGraw Hill Publications, 2012
10. Michael Minelli (Author), Michele Chambers (Author), Ambiga Dhiraj (Author) , Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses,Wiley Publications,2013
11. Zikopoulos, Paul, Chris Eaton, Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data, Tata McGraw Hill Publications, 2011

IMCA-402(4) ADVANCED CONCEPTS IN DATABASE SYSTEM

w.e.f. Session 2015-16

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UNIT-I

Query Processing, Optimization and Database Tuning: Algorithms for Executing Query Operations. Heuristics for Query Optimizations, Estimations of Query Processing Cost, Join Strategies for Parallel Processors, Database Workloads, Tuning Decisions, DBMS Benchmarks, Clustering and Indexing, Multiple attribute search keys, Query Evaluation Plans, Pipelined Evaluations, System Catalogue in RDBMS. [9]

UNIT-II

Extended Relational Model and Object Oriented Database System: New Data Types, User Defined Abstract Data Types, Structured Types, Object Identity, Containment, Class Hierarchy, Logic based Data Model, Data Log, Nested Relational Model and Expert Database System. [8]

UNIT-III

Distributed Database System: Structure of Distributed Database, Data Fragmentation, Data Model, Query Processing, Semi Join, Parallel and Pipeline Join, Distributed Query Processing in R * System, Concurrency Control in Distributed Database System, Recovery in Distributed Database System, Distributed Deadlock Detection and Resolution, Commit Protocols. [9]

UNIT-IV

Enhanced Data Model for Advanced Applications: Database Operating System, Introduction to Temporal Database Concepts, Spatial and Multimedia Databases, Data Mining, Active Database System, Deductive Databases, Database Machines, Web Databases, Advanced Transaction Models, Issues in Real Time Database Design. [8]

UNIT-V

Introduction to Expert Database and Fuzzy Database System: Expert Databases: Use of Rules of Deduction in Databases, Recursive Rules.

Fuzzy Databases: Fuzzy Set and Fuzzy Logic, Use of Fuzzy Techniques to define inexact and incomplete databases [9]

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REFERENCES:

1. Majumdar and Bhattacharya, “Database Management System”, TMH.
2. Korth, Silbertz, Sudarshan, “Database Concepts”, Mcgraw Hill.
3. Elmasri, Navathe, “Fundamentals Of Database Systems”, Addison Wesley.
4. Data C J,” An Introduction to Database System”, Addison Wesley.
5. Ramakrishnan, Gehrke, “Database Management System”, Mcgraw Hill.
6. Bernstein, Hadzilacous, Goodman, “Concurrency Control and Recovery”, Addison Wesley.
7. Ceri and Palgatti, “Distributed Databases”, McGraw Hill.

IMCA-403 JAVA PROGRAMMING

w.e.f. Session 2015-16

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3	1	0

UNIT- I

Core Java: Introduction, Operators, Data Type, Variable, Arrays, Control Statements, Methods and Classes, Inheritance, Package and Interface, Exception Handling, Multithread Programming and String Handling. [8]

UNIT- II

Java Applets: Java Applet, Introduction to AWT, AWT Controls, Layout Managers, Menus, Images, Graphics, Event Handling, Networking.

Java Swings: Creating a Swing Applet and Applications, Programming using Panes Scroll Panes, Layered Panes, Tabbed Panes, Split Panes, Swing Controls Labels, Text Fields, Buttons, Toggle Buttons, Checkboxes, Radio Buttons, View Ports, Scroll Bars, Lists, Combo Box, Progress Bar, Menus and Toolbars, Layouts, Dialog Boxes, Inner Frame. [8]

UNIT-III

JDBC: The Connectivity Model, JDBC Drivers, Java SQL Package, Connectivity to Remote Database, Navigation in Database.

RMI: Introduction to RMI (Remote Method Invocation): A simple Client-Server application using RMI [8]

UNIT-IV

Java Beans: Application Builder Tools, Bean Developer Kit (BDK), JAR Files, Introspection, Developing a Simple Bean, Using Bound Properties, Java Beans API, Introduction to Enterprise Java Beans (EJB), Session Beans, Entity Beans and Message Beans [8]

UNIT-V

Java Servlets: Servlet Basics, Servlet API Basic, Life Cycle of a Servlet, Running a Servlet, Debugging Servlets, Thread-Safe Servlets, Cookies and Introduction to Java Server Pages (JSP). [8]

REFERENCES:

1. Margaret Levine Young, “The Complete Reference Internet”, TMH .
2. Naughton, Schildt, “The Complete Reference JAVA2”, TMH .
3. Balagurusamy E, “Programming In JAVA”, TMH .
4. Dustin R. Callway, “Inside Servlets”, Addison Wesley .

IMCA-404(1) CRYPTOGRAPHY AND NETWORK SECURITY

w.e.f. Session 2015-16

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3	1	0

UNIT-I

Introduction to Security Attacks , Services and Mechanisms, Introduction to Cryptology. Conventional Encryption: Conventional Encryption Model, Classical Encryption Techniques, Substitution Ciphers and Transpositions Ciphers, Cryptanalysis, Stereography, Stream and Block Ciphers, Modern Block Ciphers, Block Ciphers Principles, Shannon's Theory of Confusion and Diffusion, Fiestal Structure, Data Encryption Standards (DES), Strength of DES, Block Cipher Modes of Operation. [8]

UNIT-II

Introduction to Graph, Ring and Field, Prime and Relative Prime Numbers, Modular Arithmetic, Fermat's and Euler's Theorem, Primality Testing, Euclid's Algorithm, Chinese Remainder Theorem ,Confidentiality using Symmetric Encryption, Traffic Confidentiality, Key Distribution, Random Number Generation. Principles of Public Key Cryptosystems, RSA Algorithm, Security of RSA, Key Management, Discrete Logarithmics, Diffie-Heilman key exchange algorithm. [8]

UNIT-III

Message Authentication and Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security of Hash Function and MACS, MD5 (Message Digest Algorithm), Secure Hash Algorithm (SHA), Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS). [8]

UNIT-IV

Authentication Applications: Kerberos and X.509, Directory Authentication Service, Electronic Mail Security - Pretty Good Privacy (PGP), S / MIME. [8]

UNIT-V

IP Security: Architecture, Authentication Header, Encapsulating Security Payloads, Combining Security Associations, Key Management, Web Security: Secure Socket Layer and Transport Layer Security, Secure Electronic Transaction (SET), System Security: Intruders, Viruses and related Threads, Firewall Design Principles, Trusted systems. [8]

REFERENCES:

1. William Stallings, "Cryptography and Network Security: Principles and Practice" Prentice Hall. New Jersey.
2. Johannes A. Buchmann, "Introduction to Cryptography", Springer Verlag. Bruce Schiener, "Applied Cryptography".
3. Atul Kahate , “Cryptography and Network Security” , (2nd Edition) , TMH.

IMCA-404 (2) ERP SYSTEMS

w.e.f. Session 2015-16

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3	1	0

UNIT-I

Enterprise wide information system, Custom built and packaged approaches, Needs and Evolution of ERP Systems, Common myths and evolving realities, ERP and Related Technologies, Business Process Reengineering and Information Technology, Supply Chain Management, Relevance to Data Warehousing, Data Mining and OLAP, ERP Drivers, Decision support system. [8]

UNIT-II

ERP Domain, ERP benefits classification, Present global and Indian market scenario, Milestones and pitfalls, Forecast, Market players and profiles, Evaluation criterion for ERP product, ERP Life Cycle: Adoption decision, Acquisition, Implementation, Use and Maintenance, Evolution and Retirement phases, ERP Modules. [8]

UNIT- III

Framework for evaluating ERP acquisition, Analytical Hierarchy Processes (AHP), Applications of AHP in evaluating ERP, Selection of Weights, Role of consultants, vendors and users in ERP implementation; Implementation vendors evaluation criterion, ERP Implementation approaches and methodology, ERP implementation strategies, ERP Customization, ERP-A manufacturing Perspective. [8]

UNIT- IV

Critical success and failure factors for implementation, Model for improving ERP effectiveness, ROI of ERP implementation, Hidden costs, ERP success inhibitors and accelerators, Management concern for ERP success, Strategic Grid, Useful guidelines for ERP Implementations. [8]

UNIT- V

Technologies in ERP Systems and Extended ERP, Case Studies of Development and Analysis of ERP Systems, Implementations in focusing the various issues discussed in above units through Soft System approaches or qualitative Analysis tools, Learning and Emerging Issues, ERP and E-Commerce. [8]

REFERENCES:

1. Lexis Leon, “Enterprise Resource Planning”, TMH
2. Brady, Manu, Wegner, “Enterprise Resource Planning”, TMH

IMCA-404 (3) STORAGE TECHNOLOGY AND MANAGEMENT

w.e.f. Session 2015-16

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UNIT-I

Introduction to Storage Technology: Data Proliferation and the varying value of Data with time and usage, Sources of data and States of data creation, Data Center need and its requirements, Evolution of Storage, Overview of basic Storage Management skills and activities, The five pillars of Technology, Overview of Storage Infrastructure Components, Information Lifecycle Management concept, Data categorization within an enterprise. [8]

UNIT-II

Storage Systems Architecture: Intelligent Disk Subsystems overview, Contrast of Integrated vs. Modular Arrays, Component Architecture of Intelligent Disk Subsystems, Disk Physical Structure Components, Properties, Performance and Specifications, Logical partitioning of Disks, RAID and parity algorithms, Hot Sparing, Physical vs. logical Disk organization, Protection and Back End Management, Array Caching properties and algorithms, Front end Connectivity and Queuing properties, Front end to Host Storage Provisioning, Mapping and Operation, Interaction of File systems with storage, Storage System Connectivity Protocols. [8]

UNIT-III

Introduction to Networked Storage: Storage Domain: **DAS** (Direct attached Storage), Elements, Connectivity and Management, **NAS**(Network Attached Storage),Elements, NFS, CiFS, FTP, Filers and Appliances, Configuration and Management, **SAN**(Storage Area Network),Elements, FCP, ISCSI,FCIP,SAN Configuration and Management, **CAS** (Content Addressable storage),Elements, Connectivity and Management Storage Interfaces: SCSI, SATA, IDE, Storage Virtualization at various layers, HA Solutions, Advantages and uses. [8]

UNIT-IV

Introduction to Information Availability: Business Continuity and Disaster Recovery Basics, Local business continuity Techniques, Remote Business Continuity Techniques, Disaster Recovery principles and Techniques. [8]

UNIT-V

Managing and Monitoring: Management philosophies (Holistic vs. System and Component), Industry management Standards (SNMP, SMI-S, CIM), Standard Framework Applications, Key management Metrics (Thresholds, Availability, Capacity, Security, Performance), Metric analysis Methodologies and Trend analysis, Reactive and Pro-active Management best practices, Provisioning and Configuration Change Planning, Problem Reporting, prioritization and Handling Techniques, Management tools overview. [8]

REFERENCES:

1. Barry Mellish , Jure Arzensek, Christian Demmer , “Fiber Array Storage Technology A FAST Introduction”, Noam Rosen Publisher: IBM Redbooks.
2. Greg Schulz, “Resilient Storage Networks: Designing Flexible Scalable Data Infrastructure” ,Greg Schulz Publisher: Elsevier Science and Technology Books.

IMCA-404(4) REAL TIME SYSTEMS

w.e.f. Session 2015-16

L	T	P
3	1	0

UNIT-I

Introduction- Introduction to Real Time Systems ,Structure of Real Time system, Various classification of Real Time Systems, Embedded System, Characterizing Real Time System and Task, Various issues in Real Time Systems. [6]

UNIT-II

Task Assignment and Scheduling-Classical Uniprocessor Scheduling Algorithm, Rate Monotonic, EDF, Uniprocessor Scheduling of IRIS Tasks: Identical and Non identical Linear and Concave Reward Function, 0/1 Reward Function. Task Assignment Algorithms- Utilization Balancing, A Next-Fit Algorithm for RM Scheduling, A Myopic Offline Scheduling FAB Algorithm and Buddy Strategy. [10]

UNIT-III

Real Time Database: Real Time vs. General purpose Database, Main Memory Database, Concurrency Control issues, Real Time OS: Threads and Tasks, Kernel, Case Study of Maruti II, HART OS, VRTX. [8]

UNIT-IV

Programming Languages and Tools, Real Time Databases ,Real Time Communication, FDDI, Specification and Verification using Duration Calculus, Flow Control, Protocols for Real Time (VTCSMA, Window, IEEE 802.3, IEEE 802.4, IEEE 802.5, Stop and Go Protocol, Media Access Protocol) [8]

UNIT-V

Fault Tolerance Techniques, Introduction Fault, Fault Detection and Error Containment, Redundancy Data Diversity, Reversal Checks, Malicious and Integrated Failure Handling ,Clock Synchronization: Introduction to Clocks, A Non-fault Tolerant Synchronization Algorithms, Impact of Fault, Fault Tolerant Synchronization in H/W and S/W. [8]

REFERENCES:

1. C.M. Krishna and Shin, “Real Time Systems”, Mc Graw Hill 1985.
2. Jane W.S. LIU, “Real Time Systems”, Pearson Education.
3. Levi and Agarwal, “Real Time System”, McGraw Hill.
4. Mathi and Joseph, “Real Time System : Specification, Validation and Analysis”, PHI

IMCA-405 COMPILER DESIGN

w.e.f. Session 2015-16

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UNIT-I

Introduction to Compiler: Structure of a Compiler, Lexical analysis, Syntax analysis, Intermediate code, Optimization, Bookkeeping, Error handling, Bootstrapping.

Finite Automata and Lexical Analysis: A Simple approach to the design of Lexical analyzers, Regular expressions, Finite automata, Regular expressions convert into finite automata, Minimization or Optimization of a DFA, A language for specifying Lexical analyzer, Implementation of a Lexical analyzer. [7]

UNIT-II

The Syntactic Specification of Programming Languages: Context Free Grammars (CFG), Derivation and Parse trees, Capabilities of CFG.

Basic Parsing Techniques: Parsers, Shift Reduce parsing, Operator Precedence parsing, Top down parsing, Predictive parsers. [9]

UNIT-III

Automatic Construction of Efficient Parsers: LR Parsers, Canonical collection of LR (0) items, Constructing SLR parsing tables, Constructing canonical LR parsing tables, Constructing LALR parsing tables, Using ambiguous grammars, An automatic parser generator, Implementation of LR parsing tables, Constructing LALR sets of items. [8]

UNIT-IV

Syntax-directed Translation: Syntax-Directed Translation Schemes, Implementation of syntax directed translators, Intermediate code, Postfix notation, Parse trees and Syntax trees, Three address code, Quadruple and Triples, Translation of assignment statements, Boolean expressions, Statements that alter the flow of control, Postfix translation, Translation with a top down parser.

More about translation: Array references in arithmetic expressions, Procedures call, Declarations, Case statements.

Symbol Tables: Data structure for symbols tables, Representing scope information. [9]

UNIT-V

Run-Time Administration: Implementation of simple stack allocation scheme, Storage allocation in block structured language.

Error Detection and Recovery: Lexical phase errors, Syntactic phase errors, Semantic errors.

Introduction to code optimization: Loop optimization, DAG Representation of basic blocks, Value numbers and Algebraic laws, Global data-flow analysis. [7]

REFERENCES:

1. Aho, Sethi and Ullman, “Principle of Compiler Design”, Narosa Publishing House.
2. Santanu Chattopadhyay, “Compiler Design”, PHI.

IMCA-406 COMPUTER GRAPHICS AND ANIMATION

w.e.f. Session 2015-16

L	T	P
3	1	0

UNIT I

Introduction to Computer Graphics: Definition ,Application ,Pixel and Frame Buffer , Raster and Random Scan display , Display devices-CRT, Color CRT Monitors , Scan Conversion of line- DDA algorithm of line drawing , Bresenham's Line Algorithm, Midpoint Circle Algorithm , Polygon Filling-Scan line polygon filling algorithm , Flood Fill Algorithm and Boundary-Fill Algorithm. [8]

UNIT II

Mathematics for Computer Graphics: Point Representation, Vector Representation, Matrices and Operations Related to Matrices, Vector Addition and Vector Multiplication, Scalar Product of two Vectors, Vector Product of two Vectors.

Segments and Display Files: Segment Table, Creating, Deleting, and Renaming Segments.

Windowing and Clipping: Window to view port transformation, Point Clipping, Line Clipping (Cohen Sutherland line clipping, Liang Barsky Line Clipping Algorithm), Polygon clipping, Sutherland and Gary Hodgman polygon clipping algorithm. [8]

UNIT III

Computer Graphics Algorithm: Hidden Surface removal, Depth comparison, Z-Buffer Algorithm ,Back-Face Removal ,The Painter's Algorithm ,Scan-Line Algorithm, Light and Color ,Different color models, RGB, CMY, YIQ , Spline and Bezier Representation, Interpolation and Approximation Splines. Hermite Interpolation. [8]

UNIT IV

Transformation (2D and 3D): 2-Dimensional Transformation: Translation, Rotation, Scaling, Matrix Representation and Homogeneous Coordinate, Composite Transformation including General Pivot Point Rotation, General Fixed Point Scaling, Reflection , Shearing. 3-dimensional transformation, Translation, Rotation , Scaling, Reflection, Shear. [8]

UNIT V

3 D Animation: Introduction to 3 D Studio Max , Exploring the Max Interface, Controlling and Configuring the view ports, Working with Files, Importing and Exporting, Creating and Editing primitive Objects, Selecting and Setting Object properties, Transforming objects, Pivoting, Aligning, Snapping and Cloning Objects , Grouping and Linking objects. [8]

REFERENCES:

1. Donald Hearn And M Pauline Baker, “Computer Graphics” , PHI.
2. Kelly L. Murdock , “3ds Max- Bible 2011” ,WILEY PUBLICATIONS
3. Steven Harrington, “Computer Graphics: A Programming Approach”, TMH.
4. Prajapati A.K., “Computer Graphics”, PPM Ed2.
5. Foley James D, “Computer Graphics”, AW Ed2.
6. Newman And Sprould, “Principle Of To Interactive Computer Graphics”, Mcgraw Hill
7. Rogers, “Procedural Elements Of Computer Graphics”, Mcgraw Hill

IMCA- 471 COMPILER DESIGN LAB

w.e.f. Session 2015-16

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List of Practicals:

1. Write a program to implement TOKENIZER.
2. Write a program using call statement and CASE statement.
3. Write a program to find out FIRST / FOLLOW of grammar.
4. Evaluate POSTFIX and PREFIX expression with the help or stack.
5. Write a program to implement Operator precedence parser.
6. Design a parser like Recursive decent parser.
7. Design Predictive parser.
8. Design LR (0) Parser.

IMCA-472 JAVA PROGRAMMING LAB

w.e.f. Session 2015-16

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Writing programs in Java:

1. Program for Sorting and Searching.
2. Program for Addition and Multiplication of matrices.
3. Program illustrating overloading methods and various forms of Inheritance.
4. Program to create packages in Java
5. Program to create multiple Threads in Java.
6. Understand and handle Mouse Events, Keyboard Events using Layout Manager.
7. Adding Text area, Canvas, Scroll Bars, Frames and Menus.
8. Writing Java Applets.
9. Client Server interaction with stream socket connections (Use Net Package).
10. Client Server application using RMI
11. Writing Java Servlets.
12. Program using JDBC
13. Illustrating the concepts of Java Swings.

IMCA-473 COMPUTER GRAPHICS LAB

w.e.f. Session 2015-16

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List of Practicals:

1. Implement the line drawing algorithm and circle drawing algorithm using midpoint line scan and midpoint circle scan algorithm.
2. Write a Program to implement line clipping algorithm.
3. Write a Program to implement 2D-transforrnation.
4. Write a Program to implement 3D-algorithm for parallel and perspective projection.
5. Write a Program to represent curve and surfaces.
6. Moving (animate) any 2D··3D object along with the axis.
7. Application on Audio- Video mixing and clip making.
8. An outline of designing software like Photoshop and CorelDraw.
9. Introduction to Flash 5.0 creating a small animation using Flash 5.0.
10. Apply animation on text using 3D- Cool.
11. Introduction to creating an animation using 3-D studio Max R Animator pro/Video Studio/Scala 2000.