DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY LUCKNOW

Evaluation Scheme & Syllabus
for

MCA (Integrated)

4th Year

On

Choice Based Credit System

(Effective from the Session: 2020-21)

MCA (INTEGRATED) FOURTH YEAR, 2020-21

SEMESTER-VII

S.No.	Subject Code	Subject Name	L-T-P	ESE Marks	Sessional		Total	Credit
					CT	TA		
1.	RCAI-701	Multimedia & Animation	3-1-0	70	20	10	100	4
2.	RCAI-702	Dot Net Framework & C#	3-1-0	70	20	10	100	4
3.	RCAI-703	Computer Based Optimization Techniques	3-1-0	70	20	10	100	4
4.	RCAI-704	Software Project Management	3-1-0	70	20	10	100	4
5.	RCAI-705	Enterprise Resource Planning	3-1-0	70	20	10	100	4
6.	RCAI-751	Multimedia & Animation Lab	0-0-3	50	30	20	100	2
7.	RCAI-752	Dot Net Framework & C# Lab	0-0-3	50	30	20	100	2
		Total					**700**	**24**

CT: Class Test　　**TA**: Teacher Assessment　　**L/T/P**: Lecture/ Tutorial/ Practical

SEMESTER-VIII

S.No.	Subject Code	Subject Name	L-T-P	ESE Marks	Sessional		Total	Credit
					CT	TA		
1.	RCAI-801	Programming with Python	3-1-0	70	20	10	100	4
2.	RCAI-802	Advanced Java Programming	3-1-0	70	20	10	100	4
3.	RCAI-803	Mobile Computing	3-1-0	70	20	10	100	4
4.	RCAI-804	Computer Networks	3-1-0	70	20	10	100	4
5.	**Elective-1**		3-1-0	70	20	10	100	4
6.	RCAI-851	Programming with Python Lab	0-0-3	50	30	20	100	2
7.	RCAI-852	Advanced Java Programming Lab	0-0-3	50	30	20	100	2
		Total					**700**	**24**

CT: Class Test　　**TA**: Teacher Assessment　　**L/T/P**: Lecture/ Tutorial/ Practical

Elective-1

1. RCAI-E11　　Client Server Computing
2. RCAI-E12　　Data Warehousing& Mining
3. RCAI-E13　　Compiler Design
4. RCAI-E14　　Advanced Computer Architecture
5. RCAI-E15　　Mobile Application Development

Year-IV (Semester-VII)

RCAI-701: MULTIMEDIA & ANIMATION

UNIT-I
Introduction: Multimedia,Text, Images, Sound, Video, Animation.Elements of multimediaand their use.

UNIT-II
Multimedia Systems: Design Fundamentals, Back ground of Art, Color theory overview, Sketching & illustration, Storyboarding, different tools for animation.

UNIT-III
Multimedia Projects: Multimedia Skills, Hardware, Use of Graphics in Multimedia, Overview of Vector and Raster Graphics, Basic software tools, Multimedia Authoring Tools, Planning and Costing, Designing and Producing, Contents and talent, Delivering, Enhancing and Testing Multimedia Projects.

UNIT-IV
Tools of Multimedia: Paint and Draw Applications, Graphic effects and techniques, Image File Format, Anti-aliasing, Morphing, Multimedia Authoring tools, professional development tools.

UNIT-V
Animation: Principles of Animations, Elements of animation and their use, Power of Motion, Animation Techniques, Animation File Format, Making animation for Rolling Ball, making animation for a Bouncing Ball, Animation for the web, GIF, Plugins and Players, Animation tools for World Wide Web.

*References***:**

1. Vaughan T., "Multimedia, Making IT Work",Tata McGraw Hill.
2. KoegelBuford J.F., "Multimedia Systems", Addison Wesley.
3. Li Ze-Nian andDrewMark S., "Fundamentals of Multimedia", Pearson Education.
4. AndleighP. K. and Thakrar K., "Multimedia Systems Design", PHI Learning Private Limited, Delhi India.
5. Elsom-Cook M., "Principles of Interactive Multimedia",Tata McGraw Hill.

RCAI-702: DOT NET FRAMEWORK & C#

UNIT-I
The .Net framework: Introduction, The Origin of .Net Technology, Common Language Runtime (CLR), Common Type System (CTS), Common Language Specification (CLS), Microsoft Intermediate Language (MSIL), Just-In –Time Compilation, Framework Base Classes.

UNIT-II
C-Sharp Language (C#): Introduction, Data Types, Identifiers, Variables, Constants, Literals, Array and Strings, Object and Classes, Inheritance and Polymorphism, Operator Overloading, Interfaces, Delegates and Events. Type conversion.

UNIT-III
C# Using Libraries: Namespace-System, Input-Output, Multi-Threading, Networking and sockets, Managing Console I/O Operations, Windows Forms, Error Handling.

UNIT-IV
Advanced Features Using C#: Web Services, Window Services, ASP.net Web Form Controls, ADO.Net. Distributed Application in C#, Unsafe Mode, Graphical Device Interface with C#.

UNIT-V
.Net Assemblies and Attribute: .Net Assemblies features and structure, private and share assemblies, Built-In attribute and custom attribute, Introduction about generic.

References:

1. Balagurusamy E., "Programming in C#", Tata McGraw Hill
2. Panikkar S., "C# with .Net Frame Work", Firewall Media.
3. Troelsen A., "Pro C# with .NET", Dreamtech Press.
4. Alam T., ".Net Framework and C# Programming", A. B. Publication.
5. Kogent L., ".Net Programming, Black Book,Dreamtech Press.
6. MacDonald M., "The complete Reference ASP.Net", McGraw Hill.

RCAI-703 :COMPUTER BASED OPTIMIZATION TECHNIQUES

UNIT-I
Introduction to OR & Linear Programming Problems (LPP): Nature and meaning of 'OR', Principles of Modeling, General methods for solving 'OR' Models, Main characteristics of 'OR', Main phases of 'OR', Scope of 'OR', Role of 'OR' in decision making. Definition of LPP, Graphical Solutions of Linear Programming Problems, Simplex Method, and Artificial Variable Method, Two Phase Method, Big-M method, Dual Simplex Method.

UNIT-II
Transportation Problems: Introduction to Transportation Model, Matrix Form of TP, Applications of TP Models, Basic Feasible Solution of a TP, Degeneracy in TP, Formation of Loops in TP, Solution Techniques of TP, Different Methods for Obtaining Initial Basic Feasible Solutions viz. Matrix Minima Method, Row Minima Method, Column Minima Methods, Vogel's Approximation Method, Techniques for Obtaining Optimal Basic Feasible Solution.
Assignment Problems: Definition, Hungarian Method for AP.

UNIT-III
Replacement Problems-Capital equipment-discounting costs-replacement in anticipation of failure- group replacement-stochastic nature underlying the failure phenomenon.
Integer Linear Programming Problems: Integer Linear Programming Problems, MixedInteger Linear Programming Problems, Cutting Plane Method, Branch and Bound Method.

UNIT-IV
Preliminaries: Inventory Models: Inventory models–various costs-deterministic inventory models, Single period inventory model with shortest cost, stochastic models, Application of inventory models, Economic lot sizes-price breaks.

UNIT-V
Dynamic Programming: Bellman's Principle of optimality of Dynamic Programming, Multistage decision problem and its solution by Dynamic Programming with finite number of stages, Solution of linear programming problems as a Dynamic Programming problem

References:

1. Taha H. A., "Operations Research – An Introduction", Prentice-Hall India
2. Wagner H. M., "Principles of Operations Research with Applications to Managerial Decisions", PHI.
3. Swarup K., "Operations Research", Sultan Chand & Sons.
4. Chawla K. K., Gupta V. and Bhushan K. S., "Operations Research- Quantitative Analysis for Management", Kalyani Publishers.

RCAI-704 : SOFTWARE PROJECT MANAGEMENT

UNIT-I
Introduction and Software Project Planning: Fundamentals of Software Project Management (SPM), Need Identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

UNIT-II
Project Organization and Scheduling: Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.

UNIT-III
Project Monitoring and Control: Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

UNIT-IV
Software Quality Assurance and Testing: Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Cleanroom process.

UNIT-V
Project Management and Project Management Tools: Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project.

References:

1. CotterellM. andHuges B., "Software Project Management", Tata McGraw Hill.
2. Conway K., "Software Project Management from Concept to Deployment", Black Book, Dreamtech Press.
3. KelkarS. A., "Software Project Management", Prentice Hall of India.
4. Thayer R.H and Yourdon. E ,"Software Engineering Project Management", Wiley India.

RCAI-705 :ENTERPRISE RESOURCE PLANNING

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.

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 & Maintenance, Evolution and Retirement phases, ERP Modules.

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 vendor's evaluation criterion, ERP Implementation approaches and methodology, ERP Implementation strategies, ERP Customization, ERP-A manufacturing Perspective.

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.

UNIT-V
Technologies in ERP Systems and Extended ERP, Case Studies Development and Analysis of ERP 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.

References:

1. Leon A. L., "Enterprise Resource Planning", Tata McGraw Hill Publishing.
2. Kurbel K. E., "Enterprise Resource Planning and Supply Chain Management", Springer.
3. Sumner M., "Enterprise Resource Planning", Pearson Education India.
4. Ray R., "Enterprise Resource Planning", Tata McGraw Hill Education.

RCAI-751 :MULTIMEDIA & ANIMATION LAB

1. WRITE TO GENRATE AN ANIMATION TO REPRESENT THE GROWING MOON.
2. WRITE TO GENRATE AN ANIMATION TO INDICATE A BALL BOUNCING ON STEPS.
3. WRITE TO GENRATE AN ANIMATION TO DRAW THE TABLE FAN BLADES.
4. WRITE TO GENRATE SIMULATES A BALL HITTING ANOTHER BALL.
5. WRITE TO GENRATE TO CHANGE A CIRCLE INTO A SQURE USING FLASH.
6. WRITE TO GENRATE AN ANIMATION TO INDICATE A FOR ROLLING BALL.
7. WRITE TO GENRATE   A 3D PLANET USING FLASH.
8. WRITE TO GENRATE AN ANIMATION MOVING CAR.
9. WRITE TO GENRATE AN ANIMATION FLYING BUTTERFLY.
10. WRITE TO PREPARE A COVER PAGE FOR THE BOOK IN YOUR SUBJECT AREA.
11. WRITE TO GENRATE AN ANIMATION RUNNING MAN
12. WRITE TO GENRATE TYPE A WORD AND APPLY THE EFFECTS SHADOW EMBOSS
13. WRITE TO GENRATE AN ANIMATION EMOTICONS
14. WRITE TO DESIGN A VISITING CARD CONTAINING ATLEAST ONE GRAPHIC AND TEXT INFORMATION
15. WRITE TO GENRATE AN ANIMATION WITH THE FOLLOWING FEATURES.
     WELCOME
     * Letters should appear one by one
     * The fill colour of the text should change to a different colour after the display of the full Word

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

RCAI- 752 : DOT NET FRAMEWORK & C# LAB

1. WRITE A PROGRAM TO CONSOLE PROGRAM TO ADD TWO INTEGERS.
2. WRITE A PROGRAM TO CALCULATE THE TOTAL MARKS OF STUDENTS IN 3 SUBJECTS AND THE PERCENTAGE THEY SCORED USING WINDOWS APPLICATION.
3. WRITE THE CODE FOR CREATING A SIMPLE LOGIN PAGE WITH WINDOWS APPLICATION.
4. WRITE A PROGRAM TO FIND OUT THE GRADES OF STUDENTS AS PER THEIR MARKS STORED USING WINDOWS APPLICATION.
5. WRITE A PROGRAM TO CREATE A CLASS SUM IN PROJECT AND ACCESS IT USING WINDOWS APPLICATION.
6. WRITE A PROGRAM TO CREATE A CLASS SUB IN CLASS LIBRARY AND ACCESS IT IN WINDOWS APPLICATION PROJECT.
7. WRITE A PROGRAM TO CREATE A DATABASE STUDENT WITH FIELDS: ROLL NO, NAME, ADDRESS, SEM. ACCESS IT ON THE WINDOW PAGE USING DATAGRIDVIEW CONTROL.
8. WRITE A PROGRAM TO IMPLEMENT ADROTATOR ON WEB PAGE.
9. WRITE A PROGRAM TO CREATE A WEB PAGE DISPLAYING DETAILS OF ABC INFOTECH. ADD AT LEAST 5 CONTROLS ON THIS WEB PAGE FOR EXAMPLE: CALENDAR TO DISPLAY THE UPCOMING EVENTS OF COMPANY, TEXTBOX AND BUTTONS TO GIVE ACCESS TO AUTHORIZED USER BY LOGGING IN, COMBO BOX TO SELECT PARTICULAR PRODUCT OF COMPANY. ETC.
10. WRITE A PROGRAM TO IMPLEMENT INTERFACE ON WINDOW PAGE.
11. WRITE A PROGRAM TO IMPLEMENT DELEGATE ON WINDOW APPLICATION.
12. WRITE A PROGRAM FOR USING A STANDARD CONTROLS IN WINDOWS FORM.
13. WRITE A WEB APPLICATION THAT GENERATES THE "INDEXOUTOFRANGE" EXCEPTION WHEN A BUTTON IS CLICKED. INSTEAD OF DISPLAYING THE ABOVE EXCEPTION, IT REDIRECTS THE USER TO A CUSTOM ERROR PAGE. ALL THE ABOVE SHOULD BE DONE WITH THE TRACE FOR THE PAGE BEING ENABLED.
14. CREATE A SIMPLE WEB SERVICE THAT CONVERTS THE TEMPERATURE FROM FAHRENHEIT TO CELSIUS, AND VICE VERSA CREATE A SIMPLE WEB SERVICE THAT CONVERTS THE TEMPERATURE FROM FAHRENHEIT TO CELSIUS, AND VICE VERSA. ALSO WRITE AN ASP PROGRAM TO CONSUME THIS WEB SERVICE.
15. WRITE A PROGRAM TO DELETE ALL COOKIES OF YOUR WEB SITE THAT HAS CREATED ON THE CLIENT'S COMPUTER.

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

Year-IV (Semester-VIII)

RCAI-801 :PROGRAMMING WITH PYTHON

UNIT-I
Fundamentals : Introduction, Features, Strengths, Using the Python interpreter, Program execution, Character set, Tokens, Variables, Data types, Operators, Expressions, Program input and program output, Command lines, The IDLE user interface.
Control Statements - if statements, Looping statements- while statement, for statements, nested loops.

UNIT-II
Objects: Strings- Creating and accessing strings, Substrings, Operators, Formatting expressions, Methods and Functions. Lists-Creating and accessing lists, Sequence operators, Type specific operators, Methods and functions. Tuples- accessing tuples, tuple operations, built-in functions and methods. Dictionaries- key: value pair, basic operations, functions, methods.

UNIT-III
Functions: Defining and calling a function, Types of functions, Passing parameters, Polymorphism in Python, Scope, Global statement, Nested functions, Recursive functions, Anonymous objects.
Modules: Creating modules, Namespaces, Reloading modules, Packages.

UNIT-IV
File Handling: Introduction, File types, Creating, Opening, Closing, Renaming, Accessing and deleting files, File pointers, File modes, Binary files.
Exception Handling: Introduction, Exception, Default exception handlers, Handling multiple errors, Raising exceptions, generators.

UNIT-V
Classes and Objects: Classes, Class attributes, Instances, Instance attributes, Binding and method invocation, Inheritance, polymorphism, Built-in functions for classes and instances.
Files and input/output: Reading and writing files, Methods of file objects, Using standard library functions, Date and time.

References:

1. Brown M. C., "The Complete Reference", McGraw Hill.
2. Budd T.A., "Exploring Python", McGraw Hill.
3. Shaw Z.A., "Learn Python the Hard Way", Pearson.
4. Dawson M., "Python Programming –for the Absolute Beginner", Cengage Learning.

RCAI-802 :ADVANCED JAVA PROGRAMMING

UNIT-I
EJB : Introduction to EJB, Types of EJB, Advantages of EJB, Lifecycle of enterprise beans, Working withSession Bean, Introduction to Java message service(JMS), JMS Architecture, JMS Programming API, Stepsfor writing JMS clients (sender and receiver), JMS and message driven bean, Entity bean, session bean,Message driven bean.

UNIT-II
J2EE : Overview of J2EE Technologies, Why J2EE?, J2EE Architecture, J2EE APIs, J2EE Containers, JavaServer Pages: Basic JSP Architecture, Life Cycle of JSP (Translation, compilation), JSP Tags andExpressions, Role of JSP in MVC-2, JSP with Database, JNDI: The Java Naming and Directory Interface,Java Mail: An overview of the Java Mail API.

UNIT-III
JAVA Script : Introduction to JavaScript, Difference between Java and JavaScript,JavaScript Characteristics, JavaScript and Common Programming Concepts: Variables,JavaScript Expressions, Operators, Inline Scripting, Keywords and Reserved Words, controlflow, array, built-in functions, user defined function, dialog box.Handling events using JavaScript, Built-in objects in JavaScript, session andcookies.

UNIT-IV
JSP : Introduction to java server pages (JSP), JSP applicationdesign, tomcat server, JSP objects, declaring variables, and methods, debugging, sharing databetween JSP pages, Session, Application: data base action , development of java beans in JSP,

UNIT-V
Servlets: Web Application Basics, Architecture and challenges of Web Application, Introduction toservlet, Servlet life cycle, Handling Request and Response, Initializing a Servlet, The Servlet API, HTTPServelets, HTTP request and Response, Developing and Deploying Servlets , Accessing Database, SessionTracking & Management, Dealing with cookies, Transferring Request, Accessing Web Context, PassingINIT and CONTEXT Parameter, Sharing information using scope object, Controlling concurrent access,User Authentication.

References:

1. Sierra K and Bates B., "Head fFirst EJB", SPD Publication.
2. Keogh J, "J2EE the Complete Reference", McGraw Hill.
3. Hunter J and William C., "Java Servlet Programming", SPD Publication.
4. Bayross I., " Web Enabled Commercial Application Development using HTML,DHTML,JavaScript, Perl, CGI", BPB Publication.
5. Bangia R., "Internet and Web Design" , New Age International
6. Zukowski J., "Java 2 J2SE 1.4", BPB Publication.
7. Maruyama H., Tamura K. and Uramoto N., "XML and Java Developing Web Application", Pearson Education

RCAI-803 : MOBILE COMPUTING

UNIT–I
Introduction, Issues in mobile computing, Overview of wireless telephony, Cellular concept, GSM- air interface, channel structure; Location management- HLR-VLR, hierarchical, handoffs; Channel allocation in cellular systems, CDMA, GPRS, MAC for cellular system.

UNIT-II
Wireless Networking, Wireless LAN Overview- MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, Data broadcasting, Mobile IP, WAP-architecture, protocol stack, application environment, applications.

UNIT–III
Data management issues in mobile computing, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, Disconnected operations.

UNIT-IV
Mobile Agents computing, Security and fault tolerance, Transaction processing in mobile computing environment.

UNIT–V
Adhoc networks, Localization, MAC issues, Routing protocols, Global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Adhoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Adhoc Networks, applications.

References:

1. Schiller J., "Mobile Communications", Pearson.
2. Upadhyaya S. and Chaudhury A., "Mobile Computing", Springer.
3. Kamal R., "Mobile Computing", Oxford University Press.
4. Talukder A.K. and Ahmed H., "Mobile Computing Technology, Applications and Service Creation", McGraw Hill Education.
5. Garg K., "Mobile Computing Theory and Practice", Pearson.
6. Kumar S., "Wireless and Mobile Communication", New Age International Publishers.
7. Manvi S. S. and Kakkasageri M. S., "Wireless and Mobile Networks- Concepts and Protocols", Wiley India Pvt. Ltd.

RCAI-804 : COMPUTER NETWORKS

UNIT-I
Basic Concepts: Components of data communication, distributed processing, standards and organizations. Line configuration, topology, Transmission mode, and categories of networks.
OSI and TCP/IP Models: Layers and their functions, comparison of models. Digital Transmission, Interfaces and Modems: DTE-DCE Interface, Modems, Cable modems.

UNIT-II
Transmission Media: Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon capacity, comparison of media.

UNIT-III
Multiplexing: Many to one, One to many, WDM,TDM, FDM; error detection and correction, Circuit switching, packet switching and message switching.
Data link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures.

UNIT-IV
Point to point controls: Transmission states, PPP layers, LCP, Authentication, NCP. **ISDN:** Services, Historical outline, subscriber's access, ISDN Layers and broadband ISDN.

UNIT-V
Devices: Repeaters, bridges, gateways, routers, The Network Layer: Design issues, Routing algorithms, Congestion control Algorithms, Quality of service, Internetworking, Network-Layer in the internet.

References:

1. Tanenbaum A. S., "Computer Networks", Pearson Education Asia.
2. Forouzan B. A., "Data Communication and Networking", Tata McGraw Hill.
3. Stallings W., "Data and computer communications", PHI.
4. Godbole A. S., "Data Communications and Networks", Tata McGraw Hill.

ELECTIVE-1

RCAI-E11:CLIENT SERVER COMPUTING

UNIT-I
Client/Server Computing: DBMS concept and architecture, Single system image, Client Server architecture, mainframe-centric client server computing, downsizing and client server Computing, preserving mainframe applications investment through porting, client server development tools, advantages of client server computing.

UNIT-II
Components of Client/Server application: The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA).
The server: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system.

UNIT-III
Client/Server Network: connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI, CDDI) network management, Client-server system development: Software, Client–Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation, x-terminals, server hardware.

UNIT-IV
Data Storage: magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance, RAID, RAID-Disk network interface cards.
Network protection devices, Power Protection Devices, UPS, Surge protectors.
Client Server Systems Development: Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues.

UNIT-V
Client/Server System Development: Training, Training advantages of GUI Application, System Administrator training, Database Administrator training, and End-user training.
The future of client server Computing Enabling Technologies, The transformational system.

References:

1. Smith P. and GuengerichS., "Client/Server Computing", Prentice Hall of India.
2. DewireD. T., "Client Server Computing", Tata McGraw Hill.
3. Majumdar A. K. and Bhattacharya P., "Database management Systems", Tata McGraw Hill.
4. Korth H. F., Silberchatz A. and Sudarshan S., "Database System Concepts", McGraw Hill.
5. Elmasri R. andNavathe S. B., "Fundamentals of Database Systems", Addison Wesley.

RCAI-E12 : DATA WAREHOUSING& MINING

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.

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.

UNIT–III

Business Analysis, Reporting & Query Tools & Applications, On line Analytical Processing(OLAP), Patterns & Models, Statistics, Artificial Intelligence.

UNIT–IV

Knowledge Discovery, Data Mining- Introduction to Data-Mining, Techniques of Data-Mining, Decision Trees, Neural Networks, Nearest Neighbor & Clustering, Genetic Algorithms, Rule Introduction, Selecting and Using the Right Technique.

UNIT–V

Multimedia Data-Mining, Multimedia-Databases, Mining Multimedia Data, Data-Mining and the World Wide Web, Web DataMining, Mining and Meta-Data.Data Visualization and Overall Perspective, Applications of Data-Mining.

References:

1. BersonA. and Smith S. J., "Data Warehousing, Data-Mining & OLAP", Tata McGraw Hill Education.
2. Navathe E., "Fundamentals of Database Systems", Pearson Education.
3. DunhamM. H. and Sridhar S., "Data-Mining. Introductory & Advanced Topics", Pearson Education
4. Adriaans P. and Zantinge D., "DataMining", Pearson Education.
5. Han J. and Kamber M., "Datamining-Concepts and Techniques", MK publication.

RCAI-E13 :COMPILER DESIGN

UNIT-I
COMPILERS: GRAMMARS & AUTOMATA:- Languages – Grammars – Types of grammars – Context free grammar - regular expression - Recognizing of patterns - finite automation (deterministic & non deterministic) Conversion of NDFA to DFA - Conversion of regular expression of NDFA – Thompson's construction-minimization of NDFA –Derivation - parse tree – ambiguity

UNIT-II
LEXICAL ANALYSIS:- Lexical analysis- handles - token specification - design of lexical analysis (LEX) - Automatic generation of lexical analyzer - input buffering - A language for specifying lexical analyzers - implementation of lexical analyzer

UNIT-III
SYNTAX ANALYSIS – PARSING:- Definition - role of parsers - top down parsing - bottom-up parsing - Left recursion - left factoring - Handle pruning , Shift reduce parsing - operator precedence parsing – FIRST-FOLLOW- LEADING- TRAILING- Predictive parsing - recursive descent parsing. LR parsing – LR (0) items - SLR parsing – Canonical LR - LALR parsing - generation of LALR - Ambiguous grammars - error recovery

UNIT-IV
SYNTAX DIRECTED TRANSLATION:- Intermediate Languages - prefix - postfix - Quadruple - triple - indirect triples – syntax tree- Evaluation of expression - three-address code- Synthesized attributes – Inherited attributes – Conversion of Assignment statements- Boolean expressions –Backpatching - Declaration - CASE statements.

UNIT-V
CODE OPTIMIZATION:- Local optimization- Loop Optimization techniques – DAG – Dominators- Flow graphs – Storage allocations- Peephole optimization – Issues in Code Generation.

References:

1. AhoA. V., Ullman J.D. and Sethi R., " Compilers , Principles techniques and tools", Pearson Education.
2. Raghavan V., "Principles of Compiler Design", Tata McGraw Hill Education Pvt. Ltd.
3. Galles D., "Modern Compiler Design", Pearson Education.
4. Ramaiah. K. D., "Introduction to Automata and Compiler Design", PHI.
5. Mishra K. L. P. and Chandrasekaran, N. "Theory of Computer Science Automata, Languages and Computation" PHI.

RCAI-E14 :ADVANCED COMPUTER ARCHITECTURE

UNIT–I
INTRODUCTION- Parallel Computing, Parallel Computer Model, Program and Network Properties, Parallel Architectural Classification Schemes, Flynn's &Feng's Classification, Performance Metrics and Measures, Speedup Performance Laws: Multiprocessor System and Interconnection Networks; IEEE POSIX Threads: Creating and Exiting Threads, Simultaneous Execution of Threads, Thread Synchronization using Semaphore and Mutex, Cancelling the Threads.

UNIT–II
PIPELINING AND MEMORY HIERARCHY- Basic and Intermediate Concepts, Instruction Set Principle; ILP: Basics, Exploiting ILP, Limits on ILP; Linear and Nonlinear Pipeline Processors; Super Scalar and Super Pipeline Design; Memory Hierarchy Design: Advanced Optimization of Cache Performance, Memory Technology and Optimization, Cache Coherence and Synchronization Mechanisms.

UNIT–III
THREAD AND PROCESS LEVEL PARALLEL ARCHITECTURE- Introduction to MIMD Architecture, Multithreaded Architectures, Distributed Memory MIMD Architectures, Shared Memory MIMD Architecture, Clustering, Instruction Level Data Parallel Architecture, SIMD Architecture, Fine Grained and Coarse Grained SIMD Architecture, Associative and Neural Architecture, Data Parallel Pipelined and Systolic Architectures, Vector Architectures.

UNIT-IV
PARALLEL ALGORITHMS- PRAM Algorithms: Parallel Reduction, Prefix Sums, Preorder Tree Traversal, Merging two Sorted lists; Matrix Multiplication: Row Column Oriented Algorithms, Block Oriented Algorithms; Parallel Quicksort, Hyper Quicksort; Solving Linear Systems: Gaussian Elimination, Jacobi Algorithm; Parallel Algorithm Design Strategies.

UNIT–V
DEVELOPING PARALLEL COMPUTING APPLICATIONS-OpenMP Implementation in 'C': Execution Model, Memory Model; Directives: Conditional Compilation, Internal Control Variables, Parallel Construct, Work Sharing Constructs, Combined Parallel Work-Sharing Constructs, Master and Synchronization Constructs; Run-Time Library Routines: Execution Environment Routines, Lock Routines, Timing Routines; Simple Examples in 'C'. Basics of MPI.

References:

1. Hwang K.," Advance Computer Architecture", TMH.
2. MatthewN., "Beginning Linux Programming", SPD/WROX.
3. Hennessy J. L. and Patterson D. A., "Computer Architecture: A Quantitative Approach", Elsevier.
4. Dezso S., "Advanced Computer Architecture", Pearson.
5. Quinn M.J., "Parallel Computing: Theory & Practice", TMH.
6. Quinn M.J. , "Parallel Programming in C with MPI and Open MP", TMH

RCAI-E15: MOBILE APPLICATION DEVELOPMENT

UNIT-I
Introduction: Mobile applications ,Embedded systems, Market and business drivers for mobile applications, Publishing and delivery of mobile applications, Requirements gathering and validation for mobile applications

UNIT-II
Basic Design: Introduction, Basics of embedded systems design, Embedded OS Design constraints for mobile applications, Architecting mobile applications, User interfaces for mobile applications, Touch events and gestures, Quality constraints – performance, usability, security, availability and modifiability.

UNIT-III
Advanced Design: Designing applications with multimedia and web access capabilities, Integration with GPS and social media networking applications, Accessing applications hosted in a cloud computing environment, Design patterns for mobile applications.

UNIT-IV
Technology I – ANDROID: Introduction, Establishing the development environment, Android architecture , Activities and views, Interacting with UI, Persisting data using SQLite, Packaging and deployment, Interaction with server side applications, Using Google Maps, GPS and WiFi, Integration with social media applications.

UNIT-V
TechnologyII – iOS: Introduction, Objectives, features, UI implementation, Touch frameworks, Data persistence using Core Data and SQLite, Location aware applications using Core Location and Map Kit, Integrating calendar and address book with social media application, Using WiFi,   iPhone marketplace.

References:

1. Collins C., Galpin M. and Kappler M., "Android in Practice", Manning Publications.
2. PradhanA. and DespandeA. V., "Composing Mobile Apps- Learn, Explore, Apply using Android", Wiley.
3. McWherterJ. and Gowell S.,"Professional Mobile Application Development", John Wiley and Sons.
4. Mark D., Nutting J., LaMarche J. and Olsson F., "Beginning iOS 6 Development", Apress.

RCAI-851: PROGRAMMING WITH PYTHON LAB

1. WRITE A PROGRAM TO DEMONSTRATE THE USE OF IF AND IF-ELSE STATEMENTS.
2. WRITE A PROGRAM TO DEMONSTRATE THE USE OF FOR AND WHILE LOOPING STATEMENTS.
3. WRITE A PROGRAM TO PERFORM ARITHMETIC AND RELATIONAL OPERATORS ON STRINGS.
4. WRITE A PROGRAM TO DEMONSTRATE THE USE OF BUILT-IN STRING FUNCTIONS.
5. WRITE A PROGRAM TO CREATE AND ACCESS STRINGS AND SUBSTRINGS (USING INDEXING AND SLICING).
6. WRITE A PROGRAM TO CREATE AND ACCESS LISTS.
7. WRITE A PROGRAM TO DEMONSTRATE THE USE OF BUILT-IN LIST FUNCTIONS.
8. WRITE A PROGRAM TO ILLUSTRATE CREATION AND CALLING OF A FUNCTION.
9. WRITE A PROGRAM TO ILLUSTRATE THE IMPORTING OF ENTIRE MODULE.
10. WRITE A PROGRAM TO CREATE AND ACCESS TUPLES.
11. WRITE A PROGRAM TO DEMONSTRATE THE USE OF BUILT-IN TUPLE FUNCTIONS.
12. WRITE A PROGRAM TO CREATE AND ACCESS DICTIONARIES.
13. WRITE A PROGRAM TO DEMONSTRATE THE USE OF BUILT-IN DICTIONARY FUNCTIONS.
14. WRITE A PROGRAM TO CREATE, ACCESS, RENAME AND DELETE FILES.
15. WRITE A PROGRAM TO DEMONSTRATE EXCEPTION HANDLING.
16. WRITE A PROGRAM TO DEMONSTRATE OBJECT ORIENTED CONCEPTS IN PYTHON.

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.

RCAI-852: ADVANCED JAVA PROGRAMMING LAB

1. WRITE A PROGRAM ILLUSTRATING THE USE OF SESSION BEAN
2. WRITE AN EJB APPLICATION THAT DEMONSTRATES ENTITY BEAN.
3. WRITE AN EJB APPLICATION THAT DEMONSTRATES MDB.
4. WRITE A PROGRAM DEPICTING THEUSE OF JMS PROGRAMMING API
5. WRITE EXAMPLES OF MESSAGE DRIVEN ENTITYBEAN, SESSION BEAN,THREAD SYNCHRONIZATION.
6. WRITE EXAMPLES ILLUSTRATING THE USE OF J2EEAPIS AND JAVA SERVER PAGES
7. WRITE A PROGRAM TO GET FAMILIAR WITH INTERACTION OF JSPPAGE WITH BACKEND DATABASE
8. WRITE EXAMPLES DEPICTING THE HANDLING OFREQUEST AND RESPONSE
9. WRITE A PROGRAM TO GET FAMILIAR WITH SESSION TRACKING,USER AUTHENTICATION
   a. WRITE A JAVA JSP PROGRAM TO PRINT 10 EVEN AND 10 ODD NUMBER.
   b. WRITE A JAVA JSP PROGRAM TO IMPLEMENT VERIFICATION OF A PARTICULAR USERLOGIN AND DISPLAY A WELCOME PAGE.
10. WRITE A JAVA JSP PROGRAM TO GET STUDENT INFORMATION THROUGH A HTML ANDCREATE A JAVA BEAN CLASS, POPULATE BEAN AND DISPLAY THE SAME INFORMATIONTHROUGH ANOTHER JSP.
11. WRITE A JAVA JSP PROGRAM WHICH USES <jsp:plugin>TAG TO RUN A APPLET.
12. WRITE A JAVA JSP PROGRAM WHCHIMPLEMENTS NESTED TAGS AND ALSO USESTAGSUPPORT CLASS.
13. WRITE EXAMPLES ILLUSTRATING THE USE OF JAVASCRIPT VALIDATIONS AND EVENT HANDLING.
14. WRITE A PROGRAM TO CREATE COOKIES IN JAVASCRIPT.
15. WRITE A JAVA SERVLET PROGRAM TO IMPLEMENT A DYNAMIC HTML USING SERVLET (USER NAME AND PASSWORD SHOULD BE ACCEPTED USING HTML AND DISPLAYED USING A SERVLET).
16. WRITE A JAVA SERVLET PROGRAM TO DOWNLOAD A FILE AND DISPLAY IT ON THE SCREEN (A LINK HAS TO BE PROVIDED IN HTML, WHEN THE LINK IS CLICKED CORRESPONDING FILE HAS TO BE DISPLAYED ON SCREEN)
17. WRITE A JAVA SERVLET PROGRAM TO IMPLEMENT RequestDispatcher OBJECT (USE include() AND forward()METHODS).
18. WRITE A JAVA SERVLET PROGRAM TO IMPLEMENT AND DEMONSTRATE get() AND Post METHODS(USING HTTP SERVLET CLASS).
19. WRITE A JAVA SERVLET PROGRAM TO IMPLEMENT sendRedirect() METHOD(USING HTTP SERVLET CLASS).
20. WRITE A JAVA SERVLET PROGRAM TO IMPLEMENT SESSIONS (USING HTTP SESSION INTERFACE).

Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.