BHARATHIAR UNIVERSITY, COIMBATORE.
MASTER OF COMPUTER APPLICATIONS (MCA) DEGREE COURSE
(Affiliated Colleges **- Effective from the Academic Year 2016-2017)**

REVISED SCHEME OF EXAMINATIONS – CBCS PATTERN

Semester	Study Components	Course title	Ins. hrs/ week	Dur.	CIA	Marks	Total Marks	Credit
I	Paper I : Introduction to Information Technology		4	3	25	75	100	3
	Paper II : Computer Organization and Architecture		4	3	25	75	100	3
	Paper III : Problem Solving in C		4	3	25	75	100	4
	Paper IV : Accounting and Financial Management		4	3	25	75	100	3
	Paper V : Web Designing		4	3	25	75	100	4
	Practical I : Problem Solving using C Lab		5	3	40	60	100	4
	Practical II : Web Designing Lab		5	3	40	60	100	4
II	Paper VI : Data Structures		4	3	25	75	100	3
	Paper VII : Relational Database Management Systems		4	3	25	75	100	4
	Paper VIII : Operating Systems		4	3	25	75	100	3
	Paper IX : Object Oriented Analysis and Design & C++		4	3	25	75	100	4
	Paper X : Mathematical Foundations of Computer Science		4	3	25	75	100	3
	Practical III : Data Structures Lab Using C++		5	3	40	60	100	4
	Practical IV : RDBMS Lab		5	3	40	60	100	4
III	Paper XI : Visual Programming		4	3	25	75	100	4
	Paper XII : Java Programming		4	3	25	75	100	4
	Paper XIII : Analysis & Design of Information Systems		4	3	25	75	100	3
	Paper XIV: Computer Networks		4	3	25	75	100	3
	Paper XV : Operations Research		4	3	25	75	100	3
	Practical V : Visual Programming Lab		5	3	40	60	100	4
	Practical VI : Java Programming Lab		5	3	40	60	100	4

IV	Paper XVI : .NET Programming	4	3	25	75	100	4
	Paper XVII : Computer Graphics and Multimedia	4	3	25	75	100	4
	Paper XVIII **: Software Project Management**	4	3	25	75	100	3
	Paper XIX : Elective – I	4	3	25	75	100	3
	Paper XX : Elective – II	4	3	25	75	100	3
	Practical VII : .NET programming Lab	5	3	40	60	100	4
	Practical VIII : Graphics and Multimedia Lab	5	3	40	60	100	4
V	Paper XXI : Software Testing	4	3	25	75	100	4
	Paper XXII : Network Security and Cryptography	4	3	25	75	100	3
	Paper XXIII : Data Mining and Warehousing	4	3	25	75	100	3
	Paper XIV : Elective – III	4	3	25	75	100	3
	Paper XXV : Elective – IV	4	3	25	75	100	3
	Practical IX : Mini Project	5	-	-	-	100*	5
	Practical X : Software Testing Lab	5	3	40	60	100	4
VI	Project work and Viva voce					200**	10
	Total					**3700**	**135**

*   Project report - 80 marks; Viva-voce – 20 marks
** Project report - 160 marks; Viva-voce – 40 marks

ELECTIVE – I
E.1.1. Client Server Technology
E.1.2. Digital Image Processing
E.1.3. Open Source System

ELECTIVE – II
E.2.1. Mobile computing
E.2.2. Distributed Computing
E.2.3. Cloud Computing

ELECTIVE – III
E.3.1. Web Services
E.3.2. Middleware Technologies
E.3.3. Neural Networks
E.3.4. Parallel Processing

ELECTIVE – IV
E.4.1. E-Commerce
E.4.2. Embedded systems
E.4.3. Information Retrieval Techniques
E.4.4.   Big Data Analysis

Note : 1. **In semester IV Paper XVIII Software Engineering is replaced by   Software Project Management**
2. **One more elective is included in Elective III Parallel Processing and Elective IV Big Data Analysis**
3. **The syllabi of the above papers are furnished below be followed and the syllabi of remaining papers be the same as prescribed for the academic year 2014-15.**

E.4.4.   BIG DATA ANALYTICS

Objective of the subject: This paper focuses on big data handling concepts, R Programming, Map Reduce and Hadoop based analytics.

UNIT I:
Importance of Big Data: A Flood of Mythic "Start-Up" Proportions- A convergence of Key Trends- A Wider Variety of Data – The Expanding Universe of Unstructured Data. Industry Examples of Data: Digital Marketing and the Non - line World – Database Marketers, Pioneers of Big Data – Big Data and the New School of Marketing.

UNIT II:

Installing R - Installing RStudio - Understanding the features of R language - Using R packages - Performing data operations - Increasing community support - Performing data modeling in R

UNIT III:

Installing Hadoop - Understanding different Hadoop modes - Understanding Hadoop installation steps - Installing Hadoop on Linux, Ubuntu flavor (single node cluster) - Installing Hadoop on Linux, Ubuntu flavor (multinode cluster) - Installing Cloudera Hadoop on Ubuntu

UNIT IV:

Understanding Hadoop features - Understanding HDFS - Understanding the characteristics of HDFS - Understanding MapReduce -Learning the HDFS and MapReduce architecture

UNIT V:

Understanding the HDFS architecture - Understanding HDFS components - Understanding the MapReduce architecture - Understanding MapReduce components - Understanding the HDFS and MapReduce architecture by plot - Understanding Hadoop subprojects

Reference Books:

1. Michael Minelli , Michele Chambers , Ambiga Dhiraj " BIG DATA BIG ANALYTICS " , Wiley Publications, Indian Reprint 2014
2. Vignesh Prajapathi, Big Data Analytics with R and Hadoop, PACKT Publishing, 2013.

E.3.4. PARALLEL PROCESSING

Unit - I

Introduction : Parallel Processing - Shared Memory Multiprocessing - Distributed Memory - Parallel Processing Architectures - Introduction - Parallelism in sequential Machines - Abstract Model of Parallel Computer – Multiprocessor Architecture- Array Processors.

Unit – II

Principles of Pipelining : Principles of linear pipelining – classifications of pipeline processors – general pipelines and reservation tables – Interleaved memory organizations – Instruction and Arithmetic pipelines – Principles of designing pipeline architecture.

Unit – III

Programmability Issues : Overview-Operating system support-Types of Operating Systems-Parallel Programming models-Software Tools. Data Dependency Analysis: Types of Dependencies-Program Transformations- Shared Memory Programming

Unit – IV

Thread based Implementation : Thread Management - Attributes of Threads - Mutual Exclusion with Threads- Mutex Usage of Threads- Thread implementation-Events and Conditions variables-Deviation Computation with Threads-Java Threads. Distributed Computing: Message Passing Model - General Model - Programming Model – PVM.

Unit – V

Algorithms for Parallel Machines : Speedup, Complexity and cost, Histogram computation, Parallel reduction, Quadrature problem, Matrix multiplication, Parallel sorting algorithms, Solving linear systems, Probabilistic algorithms. Debugging Parallel programming – Other Parallelism Paradigms.

Text Books:

1. Kai Hwang and Faye' A. Briggs "Computer Architecture and Parallel Processing", McGRawHill International Edition, 1986.

2. M.Sasikumar, Dinesh Shikhare, Ravi Prakash P "Introduction to Parallel Processing", PHI, New Delhi, 2006.

References:

1. Jorden H. F. and Alaghaband G.,"Fundamentals of Parallel Processing", PHI, New Delhi, 2002.

2. David E.Culler; Anoop Gupta, Jaswinder Pal Singh, "Parallel Computer Architecture: A Hardware/Software Approach", Elsevier Science India, 1998.

semester IV Paper XVIII
SOFTWARE PROJECT MANAGEMENT

 Course Number: 14CS33C Number of credits: 4
Subject Description: This course presents a deep insight to software project management concepts
Contents:

Unit – I
Introduction: Software Project Management - Software Project Versus Other Project – Requirement Specification – Information and Control in Organization – Introduction to step wise Project Planning – Select – Identify Scope and Objectives - Identify Project Infrastructure – Analyze Project Characteristics – Products and Activities – Estimate Effort for each Activity – Identify Activity Risks – Allocate Resources - Review / Publicize Plan – Execute Plan and Lower Levels of Planning.

 Unit – II
 Project Evaluation : Introduction – Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation – Selection of an Appropriate Project App roach – Choosing Technologies – Choice of Process Models – Structured Methods – Rap id Application Development – Waterfall Model – V-Process Model – Spiral Model – Software Prototyping – Ways of Categorizing Prototypes – Tools – Incremental Delivery – Selection Process Model.

Unit – III
 Software Effort Estimation : Introduction – Problem s with Over and Under Estimates – Basis for Software Estimating – Software Effort Estimation Technique – Albrecht Function Point Analysis – Function Points – Object Points – Procedural Code Oriented Approach – COCOMO – Activity Planning – Project Schedules - Projects and activities – Sequencing and Scheduling Activities – Network Planning Models – Formulating a Network Planning – Adding Time Dimension – Forward Pass – Backward Pas s – Identifying the Critical Path – Activity Float - Shortening Project Duration – Identifying Critical Activities – Precedence Networks.

Unit – IV
 Risk Management : Introduction – Nature of Risk Man aging Identification – Analysis – Reducing – Evaluating – Z values – Resource Allocation – Nature of Resources – Requirements – Scheduling – Critical Paths – Counting the Cost – Resource Schedule – Cost Schedule – Scheduling Sequence – Monitoring and Control – Creating the Frame Work - Collecting the Data – Visualizing the Progress – Cost Monitoring – Prioritizing Monitoring – Change Control.

 Unit – V
 Managing Contracts : Introduction – Types of Contract – Stages in Contract Placement – Terms of Contract – Contract Management – Acceptance – Managing People and Organizing Teams – Organizational Behavior Background – Selecting the Right Person for the Job – Instruction in the Best Methods – Motivation – Decision Making – Leadership – Organizational Structures – Software Quality – Importance – Practical Measures – Product Versus Process Quality Management – External Standards – Techniques to Help Enhance Software Quality.

 Reference Books: 1. Bob Hughes and Mike Cotterell, "Software Project Management , Mc Graw Hill, Second Edition. 2. Walker Royce, "Software Project Management , Addition Wesley. 3. Derrel Ince, H. Sharp and M. Woodman, "Introduction to Software Project Management and Quality Assurance , Tata Mc Graw Hill, 1995.