M. Phil. / Ph.D. Comp. Sci. from October 2011 onwards

Bharathiar University: Coimbatore 641046

M. Phil. / Ph.D. – Computer Science

Part I – Syllabus

[From October 2011 batch onwards]

Paper I - Research Methodology

Paper II - Advanced Technologies in Computer Science

Paper III

1. Data Warehousing and Mining.
3. Advanced Networking.
4. Natural Language Processing.
5. Data Compression.
6. Agent Based Computing.
9. Knowledge Management and Business Intelligence.
15. Information Security.
PAPER I - RESEARCH METHODOLOGY

UNIT – I RESEARCH METHODS

UNIT – II ALGORITHMS AND ANALYSIS

UNIT – III COMPILER DESIGN

UNIT – IV OBJECT ORIENTED ANALYSIS, DESIGN AND DEVELOPMENT
UNIT – V SOFTWARE ENGINEERING

TEXT BOOKS:

UNIT - I
2. Dr.Rajammal P. Devadas,”A. Handbook on Methodology of Research-Sri Ramakrishna Mission Vidyalaya College of Rural Higher Education”.

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
PAPER II - ADVANCED TECHNOLOGIES IN COMPUTER SCIENCE

UNIT – I MULTIMEDIA & ITS APPLICATIONS

UNIT – II TCP/IP

UNIT – III CLIENT/SERVER TECHNOLOGY
Client/Server Computing-What is Client/Server-Types of Servers-SQL Database server-The fundamentals of SQL and relational databases -What does a database server do-Stored Procedures, Triggers and rules- SQL Middleware and federated databases-SQL middleware-Will the real SQL API Please stand up? Open SQL gateways-data warehouses-Distributed Objects and components-From Distributed Objects to components-3Tier Client Server, Object Style-CORBA-Distributed Objects, CORBA style-OMG's object management architecture-CORBA 2.0-CORBA.Object Services-CORBA common facilities –CORBA business objects.

UNIT – IV ADAPTIVE WEB TECHNOLOGY

UNIT – V DISTRIBUTED COMPUTING
Distributed Systems: Fully distributed processing systems – Networks and Interconnection structures – Designing a distributed processing system – Distributed databases- challenge of distributed data – loading factors – managing the distributed resources – division of responsibilities.

TEXT BOOKS:

UNIT - I

UNIT - II

UNIT - III
UNIT - IV

UNIT - V
PAPER III – 1. DATA WAREHOUSING AND MINING

UNIT - I

UNIT - II

UNIT – III

UNIT - IV

UNIT - V

TEXT BOOKS:
2. Jaiwei Han, Micheline Kamber , “Data Mining : Concepts and Techniques”
6. Alex Berson , Stephen J.Smith , “Data Warehousing , Data Mining & OLAP “, Tata McGrawhill
PAPER III – 2. DIGITAL IMAGE PROCESSING

UNIT – I

UNIT – II

UNIT – III

UNIT - IV

UNIT - V

TEXT BOOKS:
PAPER III – 3. ADVANCED NETWORKING

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS:
PAPER III – 4. NATURAL LANGUAGE PROCESSING

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS:
PAPER III – 5. DATA COMPRESSION

UNIT - I

UNIT - II

UNIT - III

UNIT - IV
Analog Video, Composite and Components Video, Digital Video, Video compression, MPEG and H.261.

UNIT - V

TEXT BOOKS:
PAPER III – 6. AGENT BASED COMPUTING

UNIT - I

UNIT - II
Intelligent Agent Learning- Approaches to Knowledge base development-Disciple approach for building intelligent agents- Knowledge representation-Generalization-Problem solving methods-Knowledge elicitation.

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS:
PAPER III – 7. SOFT COMPUTING

UNIT - I

UNIT - II
Models of ANN: Single layer perception, Architecture, Algorithm, application procedure - Feedback Networks: Hopfield Net and BAM - Feed Forward Networks: Back Propogation Network (BPN) and Radial Basis Function Network (RBFN) - Self Organizing Feature Maps: SOM and LVQ.

UNIT - III
Fuzzy Sets, properties and operations - Fuzzy relations, cardinality, operations and properties of fuzzy relations, fuzzy composition.

UNIT - IV

UNIT - V

TEXT BOOKS:
PAPER III – 8. SOFTWARE TESTING AND QUALITY ASSURANCE

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS:
PAPER III – 9. KNOWLEDGE MANAGEMENT AND BUSINESS INTELLIGENCE

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS:
2. Efraim Turban, Ramesh Sharda, Dursun Delen and David King, “Business Intelligence” 2nd Edition, 2010. (For Unit IV – Chapter 1, Unit – V -Chapter 6).
PAPER III – 10. GRID AND CLOUD COMPUTING

UNIT - I

UNIT - II

UNIT - III

UNIT - IV
Cloud hardware and infrastructure-clients-security-network-services-platforms-cloud storage- Cloud software architecture issues- Classification of Cloud Implementations.

UNIT - V
Operating System for the Cloud - Application Patterns and Architecture – Case Studies-Cloud Computing services available under various platforms.

TEXT BOOKS:
7. Prof (Dr.) Andreas Polze, “A Comparative Analysis of Cloud Computing Environments”.
8. Cloud Economics.
PAPER III – 11. MOBILE COMPUTING

UNIT - I

UNIT - II
Mobile computing through Internet- Mobile-enabled Applications - Developing Mobile GUIs – VUIs and Mobile Applications – Multichannel and Multi modal user interfaces – Synchronization and replication of Mobile Data - SMS architecture - Java card – GPRS – Mobile Computing through Telephony - Synchronization protocol - Context-aware applications.

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS:
UNIT - I

UNIT - II

UNIT - III

UNIT - IV
Swarm Intelligence: Biological foundations of Swarm Intelligence – Swarm Intelligence in Optimization – Particle Swarms for dynamic optimization problems.

UNIT - V
Biological Inspired computing to Natural Computing – Integration of Evolutionary Computation Components in Ant Colony Optimization – Particle Swarm Optimization based on Socio-cognition.

TEXT BOOKS:
PAPER III – 13. CONCURRENT ENGINEERING INFORMATION SYSTEM

UNIT - I
New Product Development And Management : Designing and Developing Products More Effectively - Complexity and Centrality - The Value of Operational Perspectives; Structuring the Work: Phases, Gates, and Simultaneous Engineering - Description of the NPI Process - Gate Reviews - The Practice of Simultaneous Engineering - Managing the Phase - Gate Process; Planning and Managing the Projects - The Need for Multiple Targets - Setting the Target Levels under Different Situations - Interactions among the Targets - Managing NPI Projects to Meet Cycle Time Targets - The Role of the Project Manager.

UNIT - II

UNIT - III
Concurrent Engineering Information System And Process Modeling: Design For Quality, and for Other Objective Functions (DFx); Concurrent Engineering Methods and Tools; Concurrent Engineering Information System and Process Modeling - Concurrent Engineering, Advanced Integrated Product / Process Design Methods, as Part of Collaborative Design in PLM; Integration of Concurrent Engineering and Quality, Collaborative, Networked TQM.

UNIT - IV
Software Tools For Concurrent Engineering: Concurrent Engineering Customer Requirements Analysis Modeling, Based on the QFD (Quality Function Deployment) Method, Using CORA (Component Oriented Requirements Analysis) Software Tool for PLM; Concurrent Engineering Process Failure Risk Analysis Modeling (PFRA); a Failure Mode and Effect Analysis (FMEA) Method, and Software Tool.

UNIT - V
Case Studies : Collaboration of Parametric Technology's a Failure Mode and Effect Analysis (FMEA) Method; ProEngineer Wildfire and Windchill Software Tools - Rapid Prototyping Methods, Tools - Kaizen, Kanban, JIT (Just-in-Time), and Lean Production Control Methods to Support the Integrated Design Processes and Flexible / Real-time Dynamic Supply Chains in PLM - The Lean Six Sigma Methodology - Continuous Design Improvement Methods.

TEXT BOOKS:

PAPER III – 14. SPEECH PROCESSING

UNIT - I

UNIT - II

UNIT - III
Text to Speech Synthesis: Basic principles - Rule based speech synthesis - Corpus based peech synthesis -Linguistic processing - Prosodic processing

UNIT - IV

UNIT - V

TEXT BOOKS:
PAPER III – 15. INFORMATION SECURITY

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
Cyber Crimes: Introduction – computer crime and cyber crimes; Classification of cyber crimes, Cyber crime and Related Concepts: Distinction between cyber crime and conventional crimes, Reasons for commission of cyber crime, Cyber forensic : Cyber criminals and their objectives, Kinds of cyber crimes – cyber stalking; cyber pornography; forgery and fraud; crime related to IPRs; Cyber terrorism; computer vandalism, Regulation of cyber crimes: Issues relating to investigation, Issues relating to Jurisdiction, Issues relating to Evidence , Relevant provisions under Information Technology Act, 2000, Indian Penal Code, Pornography Act and Evidence Act etc.

TEXT BOOKS: