M.Phil. / Ph.D. – COMPUTER SCIENCE

Part I – Syllabus (Effective from Academic year 2008-2009 onwards)

PAPER III - 1. Data Warehousing and Mining
               2. Digital Image Processing
               3. Advance Networking
               4. Natural Language Processing
               5. Data Compression
               6. Agent based Computing
               7. Soft Computing
               8. Embedded and Real Time Operating Systems
               9. Software Testing and Quality Assurance
              10. Knowledge Management.
Paper III : Data Warehousing and Mining

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT – V
TEXT BOOKS:

6. Alex Berson, Stephen J. Smith, “Data Warehousing, Data Mining & OLAP“, Tata McGrawhill

REFERENCE BOOKS:

2. Usama M Fayyad, Gregory Piatskey Sharpio, Padhr Smyth, Ramasamy Uthurusamy, “Advances in Knowledge discovery and data mining”.
3. Mehmed Kantardzix, ”Data Mining : Concepts Models, methods and algorithms”.
5. Margaret H. Dunham, ”Data Mining: Introductory and advanced topics”.
UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS:
Unit – I : Circuit Switching Networks

Unit – II : Packet Switching Networks

UNIT – III : High Speed Networks
Routing in optical networks- The optical layer, Node Designs, Network design and operation, Optical layer cost tradeoffs, Routing and wavelength assignment, Architectural variations, Routing in ATM networks – ATM address structure, ATM Routing, PNNI protocol, PNNI signaling protocol, Routing in the PLANET network and Deflection Routing.

Unit – IV : Security and Cryptography

Unit – V : Network Security

TEXT BOOKS :

REFERENCE BOOKS :
UNIT - I
Natural Language Processing (NLP) – open problems – major goal – language structure –
language analyzer – morphological analyzer – local world grouper (LWG) – core parser –
requirements of computational grammars – computational aspect – system aspect – large
system aspect – morphological analysis – morphological generation using paradigms –
morphological analysis using paradigms – speeding up morphological analysis by
compilation – morphological analyzer – additional issues – local word grouping – verb
groups – noun groups – strategy for grammar development – semantics in stages.

UNIT - II
Paninian grammar – semantic model – free word order and vibhakti – paninian theory –
karaka relations – active passive – control – karaka to vibhakti mapping – karaka sharing.

UNIT - III
anusaraka or language accessor – cutting the Gordian knot – structure of anusaraka

UNIT - IV
Lexical functional grammar – active passive and dative constructions – WH movements
in questions – LFG formalism – well formedness conditions – handling WH movements
in questions – computational aspects – features and feature structures – unification –
other constraints – CFG and Indian languages – functional specification – lexicalized
grammars and locality – lexicalized tree substitution grammar – lexicalized tree adjoining
grammar – feature structures – mathematical aspects

UNIT - V
Comparing TAG with PG – similarities between TAG and PG – differences between
TAG and PG – Government and binding – GB modules – X-bar theory – theta theory –
Government – Case theory – bounding theory – empty category principle (ECP) –
binding theory – constraints on movement – GB parsing – comparing GB with PG

REFERENCE BOOKS :
1. Akshar Bharati, Vineet Chaitanya, Rajeev Sangal, “Natural Language Processing – A
   Paninian Prespective”, Prentice Hall of India, 2000
UNIT-I : Introduction

UNIT – II : Different Methods of Compression
Basic Techniques : Run length encoding, RLE Text compression, RLE image compression and scalar quantization.
Dictionary methods : String compression, LZ 77, LZSS, LZ78,LZW, Unix compression, GIF image, ARC and PKZIP, Data compression patterns.

UNIT-III : Image Compression
Intuitive Methods, Image Transforms, JPEG, Progressive Image compression, Vector quantization, Adaptive Vector Quantization, Block Matching, Block Truncation coding, Context Tree weighting, Block Decomposition, Binary Tree predictive coding, Quad Trees and Finite Automata Methods.

UNIT –IV : Video Compression
Analog Video, Composite and Components Video, Digital Video, Video compression, MPEG and H.261.

UNIT – V : Audio Compression

TEXT BOOKS :
UNIT - I
Introduction to Software Agents: What is a software agent? - Why software agents? - Applications of Intelligent software agents-Practical design of Intelligent agent systems.

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
Rule refinement: Rule refinement problem- Rule refinement method- Rule experimentation and verification-Refined rule characterization-Agent interactions.

UNIT - IV

UNIT - V
Case studies in building Intelligent agents: Intelligent Agents in portfolio management-Intelligent Agents in financial services- Statistical Analysis assessment and support agent- Design assistant for configuring computer systems.

REFERENCE BOOKS :
Paper - III : 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 Propagation 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 :

REFERENCE BOOKS :
UNIT - I
Introduction to Embedded Systems-Categories of embedded Systems-specialties of embedded systems- requirements of embedded systems –challenges and issues in embedded software development – recent trends in embedded systems-Architecture of embedded systems: Hardware architecture – software architecture-application software – communication software –Embedded systems on a Chip (SoC) and the use of VLSI designed circuits.

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
Case Study-QNX Neutrino, VxWorks, MicroC/OS-II, RTLinux, POSIX, Embedded NT, and Windows XP embedded.
**TEXT BOOKS:**


   Ahmed M Ibrahim, Fuzzy logic for Embedded Systems Applications, Newness an imprint of Elsevier, 2004


**REFERENCE BOOKS:**

UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V
REFERENCE BOOKS:


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UNIT - I

UNIT - II

UNIT - III

UNIT - IV

UNIT - V

TEXT BOOKS:

REFERENCE BOOKS:

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