

SARDAR PATEL UNIVERSITY
Programme: MCA
Semester: V
Syllabus with effect from: June 2015

Paper Code: PS05CMCA01	Total Credit: 4
Title Of Paper: Artificial Intelligence	

Unit	Description in detail	Weighting (%)
1	<p>Artificial Intelligence and Knowledge-Based Systems</p> <p>Natural and Artificial Intelligence – Characteristics and Definitions of AI AI based systems, Testing the Intelligence with Turing Test, and Chinese Room Experiment, Application Areas of Artificial Intelligence, Data Pyramid and Computer Based Systems Production Systems and AI based Searches like Hill Climbing and Heuristic Search Introduction, Objectives of KBS, Components of KBS Categories of the KBS like Expert Systems, Database Management Systems in Conjunction with an Intelligent User Interface, Linked Systems, CASE Based Systems, Intelligent Tutoring Systems, etc. Issues and limitations of KBS General structure and Components of KBS, Rule Based KBS, Conflict Resolution Strategies for Rule Based Systems Knowledge-Based Shell Advantages, limitations and applications of Knowledge-Based Systems</p>	
2	<p>Development of Knowledge-Based Systems</p> <p>Development of Knowledge-Based System, Difficulties in KBS Development Knowledge-Based Systems Development Model Knowledge Acquisition Process and Techniques Knowledge Sharing, Dealing with Multiple Experts Issues in Knowledge Acquisition, Knowledge Update Characteristics of Good Knowledge Representation Scheme Factual and Procedural Knowledge Representation Applications and Users of KBS Tools and Case Studies</p>	
3	<p>Fuzzy Logic</p> <p>Fuzzy Logic and Fuzzy Sets, Membership Functions, Fuzzification and Defuzzification, Operations on Fuzzy Sets Fuzzy Functions and Linguistic Variables Fuzzy Relations, Propositions and Connectives Fuzzy Inference Fuzzy Rules, Fuzzy Control System and Fuzzy Rule Based Systems</p>	
4	<p>Connectionist Models</p> <p>Introduction to ANN, Biological Neuron and Artificial Neuron Hopfield Model of ANN, Parallel Relaxation Linearly Separable Problems, Single Perceptron</p>	



	Non linearly Separable Problems, Fixed Increment Perceptron Learning Multi Layer Perceptron, Back Propagation in Multi Layer Perceptron, General Learning Paradigms: Supervised and Unsupervised Learning Self Organizing Maps, Applications of ANN and Cases	
5	Genetic Algorithms Introduction to Genetic Algorithm, Fundamental Concepts of GA: Gene, Population, Fitness Functions, Generations, Basic Terminology, Typical GA Cycle Encoding Strategies, Genetic Operators, Fitness Functions Function Optimization, Designing Special Operators and Edge Recombination Schema, Genetic Programming	
6	Advanced Trends and Applications Constituents of Soft Computing, Neuro-fuzzy Systems, Neuro-genetic Systems and Neuro-fuzzy-genetic Systems Multiagent Systems Agents, Characteristics, Definition, and Usage Typology of Agents with Structures and Examples such as -Collaborative Agent, Interface Agent, Mobile Agent, Information and Intelligent agents Agent Communication Agents and Objects, Agents and Expert Systems Generic Structure of Multiagent System and example Knowledge Management Introduction, Perspectives, Drivers and Elements of Knowledge Management Knowledge Management Processes KM Tools and Technologies Knowledge Grid Introduction, WWW, Semantic Web, Data Grid, and Semantic Grid, Data Grid Structure, Knowledge Grid Structure and Example	

Basic Text & Reference Books

- Akerkar RA and Sajja P S, Knowledge-Based Systems, Jones & Bartlett Publishers, Sudbury, MA, USA, 2009
- Rushell and Norvig, Modern Approach to Artificial Intelligence, Prentice Hall of India Ltd., 2006
- Rich and Knight, Artificial Intelligence, Tata McGraw Hill Publishing Co. Ltd., 21st Indian Reprint, 2001
- Vijyalaxmi Pai and Rajasekaran, Neural Network, Fuzzy Logic and Genetic Algorithms, Prentice Hall of India, 2003
- Amrit Tiwan, The Knowledge Management Toolkit, Pearson Education Inc., Third Impression, 2008
- Sajja P S and Akerkar RA, Advanced Knowledge-Based systems: Models, Applications and Research Trends, TMRF, Kolhapur, India, 2009
- J S R Jang, C T Sun and E Mizutani, Neuro-Fuzzy Soft Computing, Prentice Hall of India Ltd., 1997
- Peter Jackson, Introduction to Applied Expert systems, Pearson Education Ltd., Second Indian Reprint, 2001
- David W Rolston: Principles of AI & ES Development, McGraw Hill, 1988.
- David E. Goldberg, Genetic Algorithms in Search, Optimization & Machine Learning, Pearson Education, 2002

