ANNEXURE A

SYLLABUS

RAYAT-BAHRA UNIVERSITY **University School of Engineering and Technology** **Department of Computer Science & Engineering**		
B.Tech	**DEPT Core**	**IV Year - VII Sem**
Theory & Lab Course Offered by:	School: USET	Dept: CSE
Course Code	CSG451	
Course Title	**Artificial Intelligence and Neural Networks**	
Credits	**3-0-1 (4)**	
Contact Hours (L-T-P)	**3-0-1 (5)**	
Outline Syllabus: 48 Lecture Hours; 26 Lab Hours;		
Unit A: Introduction to Artificial Intelligence		
Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing		
Unit B: Introduction to Search		
Searching for solutions, uniformed search strategies, Informed search strategies, Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha - Beta pruning.		
Unit C: Knowledge Representation & Reasoning		
Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models, Bayesian Networks.		
Unit D: Machine Learning		
Supervised and unsupervised learning, Decision trees, Statistical learning models, Learning with complete data - Naive Bayes models, Learning with hidden data - EM algorithm, Reinforcement learning		
Unit E: Pattern recognition		
Introduction, Design principles of pattern recognition system, Statistical Pattern recognition, Parameter estimation methods		
Unit F: Analysis and Languages for AI Problem Solving		
Principle Component Analysis and Linear Discriminant Analysis, Classification Techniques – Nearest Neighbor, Rule, Bayes Classifier, Support Vector Machine, K –means clustering. Introduction to Prolog- syntax and data structures, representing objects and relationships, built in predicates. Introduction to LISP- basic and intermediate LISP programming.		
LAB EXPERIMENTS (Minimum of 7 Experiments Mandatory)		
Lab Expt.1	To solve Tower of Hanoi problem using recursion.	
Lab Expt.2	To implement Breadth first search (BFS).	
Lab Expt.3	To implement Depth first search (DFS).	
Lab Expt.4	Solving Travelling salesman problem.	
Lab Expt.5	To find the solution of 8-puzzle.	

Lab Expt.7	To solve monkey-bananas problem.
Lab Expt 8	To simulate a multilayer Perception Network for XOR gate.
Lab Expt 9	To identify odd and even numbers by back propagation.
Lab Expt 10	To implement Hopfield neural network.
Lab Expt 11	To solve TSP using Genetic Algorithm.
Internal Assesment (Theory)	**50 marks**(Class Teacher and Dept or School Panel)
Mid Term Tests	30 marks(Average of 2 midterm tests -30 marks each)
Assignments	10 marks
Quiz or class test	5 marks
Seminar or Presentation	5 marks
ETE: (Theory Component):	**50 marks**
References :	
Text book	1. Kevin Knight, Elaine Rich, B. Nair, Artificial Intelligence, McGraw Hill, 2008.
Supplementary Reference(s)	1. D.W. Patterson, Introduction to AI and Expert Systems, PHI. 2. N.J. Nilsson, Principles of Artificial Intelligence, Kaufmann,1980 3. Saroj Kaushik, Logic and Prolog Programming, New Age International Publications. 4. PH. Winston, Artificial Intelligence, Addison Wesley. 5. E Charniak and D McDermott, "Introduction to Artificial Intelligence", Pearson Education.
Pedagogical Methods	White/Black Board/ Seminars/ PPT/Lab Experiments & Demonstrations.