DR. RAM MANOHAR LOHIA AVADH UNIVERSITY, AYODHYA

Syllabus of the Minor Subject
Artificial Intelligence
For First and Second year of B.A./B.Sc./B.Com

Syllabus Developed by				
SN	**Name of Expert/BoS Member**	**Designation**	**Department**	**College/ University**

Programme/Class: Certificate	**Year: Second**	**Semester: III and IV**
Subject: Minor (Elective)		
Course Code: M040301T	**Course Title: Artificial Intelligence**	
Credits: 05	**Minor / Elective**	
Max. Marks: 25+75	**Min. Passing Marks:**	
Total No. of Lectures-Tutorials-Practical (in hours per week): L-T-P: 5-0-0		

Unit	**Topics**	**No. of Lectures**
I	Concept of AI, history, current status, scope, agents, environments, Problem Formulations, Review of tree and graph structures, State space representation, Search graph and Search tree.	**15**
II	Search Algorithms: Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search, Best first search, A* algorithm, Game Search.	**12**
III	Probabilistic Reasoning : Probability, conditional probability, Bayes Rule, Bayesian Networks-representation, construction and inference, temporal model, hidden Markov model.	**12**
IV	Markov Decision process : MDP formulation, utility theory, utility functions, value iteration, policy iteration and partially observable MDPs.	**12**
V	Reinforcement Learning : Passive reinforcement learning, direct utility estimation, adaptive dynamic programming, temporal difference learning, active reinforcement learning- Q learning.	**12**
VI	Exercises: 1. Write a programme to conduct uninformed and informed search. 2. Write a programme to conduct game search. 3. Write a programme to construct a Bayesian network from given data.	**12**

	4. Write a programme to infer from the Bayesian network. 5. Write a programme to run value and policy iteration in a grid world. Write a programme to do reinforcement learning in a grid world.	

SUGGESTED BOOKS:

1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach" , 3rd Edition, Prentice Hall
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill
3. Trivedi, M.C., "A Classical Approach to Artifical Intelligence", Khanna Publishing House, Delhi.
4. Saroj Kaushik, "Artificial Intelligence", Cengage Learning India, 2011
5. David Poole and Alan Mackworth, "Artificial Intelligence: Foundations for Computational Agents", Cambridge University Press 2010.

WEBSITES FOR REFERENCE:

1. https://nptel.ac.in/courses/106105077 https://nptel.ac.in/courses/106106126
2. https://aima.cs.berkeley.edu https://ai.berkeley,edu/project_overview.html (for Practicals)