

Panipat Institute of Engineering & Technology

Department of CSE-AI&DS

LESSON PLAN

Subject: Reinforcement Learning

Subject code: PC-CS-AIDS-402A

Session: Jan.-June 2023-24

Semester: VIII

SNo	Topic	CO Covered	Assignment No.	Teaching Methodology
1	Origin and history of Reinforcement Learning research	CO1	Assignment no.-1	Board
2	Its connections with other related fields			Board
3	different branches of machine learning.			PPT
4	The Reinforcement Learning Process			PPT
5	Elements of Reinforcement Learning			PPT
6	RL Agent Taxonomy			Board
7	Reinforcement Learning Problem.			Board
8	Introduction to RL terminology	CO2	Assignment No. 2	Board
9	Markov property, Markov chains			PPT
10	Markov reward process			PPT
11	Introduction to and proof of Bellman equations for MRPs along with proof of existence of solution to Bellman equations in MRP			Board
12	Introduction to Markov decision process (MDP)			PPT
13	state and action value functions,			Board
14	Bellman expectation equations			PPT
15	optimality of value functions and policies,			PPT
16	Bellman optimality equations.			PPT
17	Overview of Monte Carlo methods for model free RL	CO3	Assignment No. 3	Board
18	First visit and every visit Monte Carlo,			Board
19	Monte Carlo control,			PPT
20	On policy and off policy learning, Importance sampling.			PPT
21	TD Methods Incremental Monte Carlo			Board

22	Methods for Model Free Prediction, Overview TD(0),			Board
23	Overview TD (1) and TD(λ)			Board
24	k-step estimators, unified view of DP			PPT
25	MC and TD evaluation methods			Board
26	TD Control methods - SARSA,			Board
27	Q-Learning and their variants			PPT
28	Getting started with the function approximation methods	CO4	Assignment No. 4	Board
29	Revisiting risk minimization			Board
30	gradient descent from Machine Learning			PPT
31	Gradient MC and Semi-gradient TD (0) algorithms,			PPT
32	Eligibility trace for function approximation, Afterstates			Board
33	Control with function approximation			Board
34	least squares			PPT
35	Experience replay in deep Q-Networks			PPT