COMSATS University Islamabad
Department of Computer Science
Course Description Form (CDF)

Course Information

Course Code: **CSC462** Course Title: **Artificial Intelligence**
Credit Hours: **4(3,1)** Lecture Hours/Week: **3**
Lab Hours/Week: **3** Pre-Requisites: **CSC102-Discrete Structures**

Catalogue Description:

This course gives a broad overview of the fundamental theories and techniques of Artificial Intelligence. Topics include: Overview of Artificial Intelligence; Agents & Environments; Problem-Solving; Adversarial Search; Constraint Satisfaction Problems; Knowledge Representation & Reasoning; Uncertainty; and Automated Planning.

Unit wise Major Topics:

Unit	Topic	No. of teaching hours
1.	Artificial Intelligence: Definitions, Overview, History, Rationality, Agents, and Environments.	4.5
2.	Problem-Solving: Problem-Solving Agents; Searching: Search Algorithms, Uninformed & Informed Search Strategies, Local Search & Optimization Problems, and Heuristic Functions.	6
3.	Adversarial Search: Game Theory, Heuristic, Min-Max Procedure & Alpha-Beta Pruning; and Monte Carlo Simulation.	6
4.	Constraint Satisfaction Problems (CSPs): Defining, Constraint Propagation, Inference, and Backtracking.	7.5
5.	Knowledge Representation & Reasoning: Knowledge-Based Agents, Propositional Logic, Propositional Theorem Proving, CNF & DNF, Horn Clauses, Forward & Backward Chaining, Knowledge Engineering in First-Order Logic; and Expert System.	9
6.	Uncertainty: Quantifying Uncertainty; Acting under Uncertainty; Representing Knowledge in an Uncertain Domain, Time & Uncertainty, and Inference in Temporal Models.	6
7.	Automated Planning: Definition, Algorithms, Heuristics & Hierarchical Planning, Acting in Nondeterministic Domains, Time, Schedules, and Resources.	6
Total Contact Hours		**45**

Mapping of CLOs and SOs

Sr.#	Unit #	Course Learning Outcomes	Blooms Taxonomy Learning Level	SO
CLO's for Theory				
CLO-1	1	Articulate how artificial intelligence enables the capabilities of a computer, machine, or system to mimic	*Understanding*	1

		the human brain.		
CLO-2	2-3	Apply various AI problem solving and searching techniques to a real-world problem.	*Applying*	1,2
CLO-3	4	Formulate a problem specified in natural language as a constraint satisfaction problem.	*Applying*	2
CLO-4	5	Apply resolution to a set of logic statements to answer a query.	*Applying*	2
CLO-5	6-7	Compare various planning strategies for different applications under uncertainty.	*Analyzing*	2
CLO for Lab				
CLO-6	2-4	Implement various searching technique, CSP and knowledge-based system to solve a problem.	*Applying*	2,4

CLO Assessment Mechanism

Assessment Tools	**CLO-1**	**CLO-2**	**CLO-3**	**CLO-4**	**CLO-5**	**CLO-6**
Quizzes	Quiz 1	Quiz 2	Quiz 3	Quiz 4	-	-
Assignments	-	Assignment 1	Assignment 2	Assignment 3	Assignment 4	Lab Assignments
Mid Term Exam	Mid Term Exam	Mid Term Exam	Mid Term Exam	-	-	-
Final Term Exam	Final Term Exam					-

Text and Reference Books

Textbook:

1. Artificial Intelligence: A Modern Approach, Russell, S., and Norvig, P., Pearson, 2020.

Reference Books:

1. Artificial Intelligence Basics: A Non-Technical Introduction, Taulli, T., Apress, 2019.