

CS -701: Artificial Intelligence

Introduction: 6 L

Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent Approaches, Introduction to intelligent agents, their structure, behavior and environment.

[1]: [1.1, 1.2, 2.1 to 2.4]

Problem Solving and Searching Techniques: 15 L

Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, Local Search, Heuristics Search Techniques , Best First Search, A* Algorithm, Constraint Satisfaction Problem, Means-End Analysis, Introduction to Game Playing, Min Max and Alpha Beta Pruning.

[2]: [2.1 to 2.5, 3.1 to 3.3, 3.5, 12.1 to 12.3]

Knowledge Representation: 9 L

Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Frames, Production Rules, Conceptual Graph, Conceptual Dependencies.

[3]: [4.1 to 4.9, 7.1 to 7.4]

[2]: [10.1]

Programming in Logic: 9 L

PROLOG Programming.

[4]: [1.1 to 1.8, 2.1 to 2.6 , 3.1 to 3.8 , 4.1 to 4.4]

Planning: 5 L

The Planning Problem, Planning with State Space Search, Partial Order Planning.

[1]: [10.1, 10.2, 10.4.4]

Understanding Natural Language:

4 L

Parsing Techniques, Context Free and Transformational Grammar, Recursive and Augmented Transition Nets.

[3] : [12.1 to 12.5]

Recommended Reading Material

Text Books

1. Russell and Norvig, *Artificial Intelligence- A Modern Approach*, 3rd edition, Pearson Prentice Hall, 2010.
2. Elaine Rich, Kevin Knight, Shivashankar B. Nair, *Artificial Intelligence*, 3rd edition, Tata McGraw Hill, 2009.
3. D W Patterson, *Artificial Intelligence and Expert Systems*, Prentice Hall of India, 2002.
4. William F. Clocksin, Christopher S. Mellish, *Programming in Prolog*, 5th Edition Springer-Verlag, 2003.

Reference Books

5. Saroj Kaushik , *Artificial Intelligence*, 1st Edition, Cengage Learning, 2011.
6. Ivan Bratko, *Prolog Programming for Artificial Intelligence*, 4th Edition, Pearson Education, 2011.

LIST OF PRACTICALS CS- 701: ARTIFICIAL INTELLIGENCE

S. No	Practical Title
1.	<ul style="list-style-type: none">• Write a prolog program to calculate the sum of two numbers.• Write a prolog program to find the maximum of two numbers.• Write a prolog program to calculate the factorial of a given number.• Write a prolog program to calculate the nth Fibonacci number.
2.	<ul style="list-style-type: none">• Write a prolog program, insert_nth(item, n, into_list, result) that asserts that

	<p>result is the list into_list with item inserted as the n'th element into every list at all levels.</p> <ul style="list-style-type: none"> • Write a Prolog program to remove the Nth item from a list. • Write a Prolog program, remove-nth(Before, After) that asserts the After list is the Before list with the removal of every n'th item from every list at all levels. • Write a Prolog program to implement append for two lists.
3.	<ul style="list-style-type: none"> • Write a Prolog program to implement palindrome(List). • Write a Prolog program to implement max(X,Y,Max) so that Max is the greater of two numbers X and Y. • Write a Prolog program to implement maxlist(List,Max) so that Max is the greatest number in the list of numbers List. • Write a Prolog program to implement sumlist(List,Sum) so that Sum is the sum of a given list of numbers List.
4.	<ul style="list-style-type: none"> • Write a Prolog program to implement two predicates evenlength(List) and oddlength(List) so that they are true if their argument is a list of even or odd length respectively. • Write a Prolog program to implement reverse(List,ReversedList) that reverses lists. • Write a Prolog program to implement maxlist(List,Max) so that Max is the greatest number in the list of numbers List using cut predicate. • Write a Prolog program to implement GCD of two numbers.
5.	<ul style="list-style-type: none"> • Write a prolog program that implements Semantic Networks/Frame Structures.

6.	<ul style="list-style-type: none">• Write a program in Jade to implement Breadth First Search algorithm• Write a program in Jade to search “COOKIES” folder in the system and delete its content.• Write a program in Jade to check the URL entered by the user.• Write a program to check the strength of the password entered by user.
7.	<ul style="list-style-type: none">• Create an agent in Jade that responds with the statistics of number of active agents in a system and the related information about those agents.• Write a program in Jade to exchange arguments between two agents.• Create four agents in Jade where each agent requests information from the remaining agents on a given topic.• Create an agent in Jade that reports about any communication going around other agents.