

**Guidelines for B.Sc. (H) Computer Science VI Semester / B.Sc. Program****V Semester/ General Elective VI Semester (NEP UGCF 2022)****Artificial Intelligence****DSC-16/ DSE/GE-6c****(Effective from Academic Year 2024-25)****Revised on 5-2-2025**

Unit	Chapter	Reference	Hours
Unit I: Introduction	Chapter 1: 1.1, 1.4 Chapter 2: Complete	[1]	4
Unit II: Problem Solving and Searching Techniques	Chapter 3: 3.1, 3.2 Chapter 5: 5.1 Chapter 6: 6.1, 6.2  Chapter 9: 9.1, 9.2, 9.3, 9.4 (except Depth-First Iterative Deepening Search and Bidirectional Search), 9.5 (except both Branch-and-Bound and Iterative Deepening A*)	[1]  [3]	15
Unit III: Knowledge Representation	Chapter 4: Complete Chapter 7: Complete (except Conceptual Graphs)  Chapter 1: 1.1, 1.2, 1.3, 1.4, 1.5 Chapter 2: 2.1, 2.2 Chapter 3: 3.1, 3.2, 3.4 Chapter 5: 5.1, 5.2, 5.3 Chapter 6: 6.7.2	[3]  [2]	17
Unit IV: Understanding Natural Languages	Chapter 12: 12.1, 12.2, 12.3, 12.4 (up to recursive transition network on Page 247)	[3]	5
Unit V: AI – The Present and the Future	Chapter 27: Complete Chapter 28: Complete	[1]	4

**References:**

- [1] Russell, Stuart, J. and Norvig, Peter, Artificial Intelligence – A Modern Approach, Pearson, 4th edition, 2020.
- [2] Bratko, Ivan, Prolog Programming for Artificial Intelligence, Addison-Wesley, Pearson Education, 4th edition, 2012.
- [3] Patterson, DAN, W, Introduction to AI and Expert Systems – PHI, 2007.

### **Suggested Practical List:**

1. Write a PROLOG program to implement the family tree and demonstrate the family relationship.
2. Write a PROLOG program to implement conc(L1, L2, L3) where L2 is the list to be appended with L1 to get the resulted list L3.
3. Write a PROLOG program to implement reverse(L, R) where List L is original and List R is reversed list.
4. Write a PROLOG program to calculate the sum of two numbers.
5. Write a PROLOG program to implement max(X, Y, M) so that M is the maximum of two numbers X and Y.
6. Write a program in PROLOG to implement factorial (N, F) where F represents the factorial of a number N.
7. Write a program in PROLOG to implement generate\_fib(N,T) where T represents the Nth term of the Fibonacci series.
8. Write a PROLOG program to implement power (Num, Pow, Ans) : where Num is raised to the power Pow to get Ans.
9. PROLOG program to implement multi (N1, N2, R) : where N1 and N2 denotes the numbers to be multiplied and R represents the result.
10. Write a PROLOG program to implement memb(X, L): to check whether X is a member of L or not.
11. Write a PROLOG program to implement sumlist(L, S) so that S is the sum of a given list L.
12. 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.
13. Write a PROLOG program to implement maxlist(L, M) so that M is the maximum number in the list.
14. Write a PROLOG program to implement insert(I, N, L, R) that inserts an item I into  $N^{\text{th}}$  position of list L to generate a list R.
15. Write a PROLOG program to implement delete(N, L, R) that removes the element on  $N^{\text{th}}$  position from a list L to generate a list R.