

PRASAD V. POTLURI SIDDHARTHA INSTITUTE OF TECHNOLOGY
(Autonomous) Kanuru, Vijayawada-520007
Department of Computer Science & Engineering (Data Science)
IV B. Tech – I Semester

Expert Systems

Course Code	23DS4702B	Year	IV	Semester	I
Course Category	PEC	Branch	CSE (Data Science)	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Artificial Intelligence
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes

Upon Successful completion of course, the student will be able to

CO1	Describe the fundamental concepts of Artificial Intelligence and Expert Systems to learn AI problem-solving approaches	L2
CO2	Apply logic-based and rule-based knowledge representation techniques, including predicate logic, semantic networks, frames, and constraint propagation, to solve problems in Expert Systems.	L3
CO3	Use expert system architectures and development processes including knowledge acquisition, tool selection, and system-building methods to design efficient expert systems	L3
CO4	Analyze challenges, limitations and pitfalls in AI and expert system development and assess strategies to overcome difficulties during planning and implementation.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3: Substantial, 2: Moderate, 1: Slight)

[illegible]

Syllabus		
Unit No	Contents	Map ped CO
I	Introduction to AI programming languages: Blind search strategies, Breadth-first – Depth first –Heuristic search techniques Hill Climbing – Best first – A Algorithms AO* algorithm – game tress, Minmax algorithms, game playing – Alpha-beta pruning.	CO1
II	Knowledge representation issues: Predicate logic – logic programming Semantic nets- frames and inheritance, constraint propagation; Representing Knowledge using rules, Rules-based deduction systems.	CO1, CO2, CO4
III	Introduction to Expert Systems: Architecture of expert systems, Representation and organization of knowledge, Basics characteristics, and types of problems handled by expert systems.	CO1, CO2, CO4
IV	Expert System Tools: Techniques of knowledge representations in expert systems, knowledge engineering, system-building aids, support facilities, stages in the development of expert systems.	CO1, CO3, CO4
V	Building an Expert System: Expert system development, Selection of the tool, Acquiring Knowledge, Building process. Problems with Expert Systems: Difficulties, common pitfalls in planning, dealing with domain experts, difficulties during development.	CO1, CO3, CO4

Learning Resources
Text Books
1. Artificial Intelligence, Elain Rich and Kevin Knight, 3 rd Edition, 2009, Tata McGraw-Hill, New Delhi 2. A Guide to Expert Systems, Waterman D.A, 1 st Edition, 1986, Addison Wesley Longman.
References
1. Artificial Intelligence: A Modern Approach, Stuart Russell and Peter Norvig, 4 th Edition, 2020, Prentice Hall 2. Artificial Intelligence, Patrick Henry Winston, 3rd Edition, 1992, Addison-Wesley 3. Artificial Intelligence and Expert Systems, Dan W. Patterson, 1 st Edition, 1999, Prentice Hall India 4. Building Expert Systems, Frederick Hayes-Roth, Douglas Lenat, and Donald A. Waterman, 1 st Edition, 1983, Addison-Wesley
E-Recourses and other Digital Material
1. https://onlinecourses.nptel.ac.in/noc25_cs159 2. https://elearn.nptel.ac.in/shop/nptel/artificial-intelligence-knowledge-representation-and-reasoning