



Course Title: Artificial Intelligence and Expert Systems

Course Level: PG

Course Code: CSE755

Credit Units: 4

L	T	P/S	SW/FW	TOTAL CREDIT UNITS
3	1	-	-	4

Course Objectives:

The study of AI & Expert system is very important for the students of Computer science. Therefore, IT Company and any research organization wants that the students should have proficiency in subject because without the judicious use of these techniques one cannot write efficient Algorithm for problem solving technique.

After studying this course students will be able to:

1. Understand the basics of State space search problems (Hill Climbing, Heuristics search etc.) in computer science.
2. Understand the various types of Knowledge Representation technique.
3. Understand the relationship between monotonic & non monotonic reasoning.
4. Understand advanced learning techniques.
5. Solve various problems using Expert system.

Pre-requisites: Programming, Data structures, Algorithms

Course Contents/Syllabus:

	Weightage (%)
Module I :	20%
Scope of AI: games, theorem proving, natural language processing, vision & speech processing, robotics, expert systems, AI techniques-search knowledge, abstraction.	
Problem solving: State space search: Production Systems, Search space control: dept-first, breadth-first search, heuristic search – Hill climbing, best-first search, branch & bound.	
Problem Reduction, Constraint Satisfaction End, Means-End Analysis	

Module II:	20%
Knowledge Representation: Predicate Logic: Unification, modus ponens, resolution, dependency directed backtracking. Rule based Systems: Forward Reasoning: conflict resolution, backward reasoning: use of no backtracks. Structured Knowledge Representation: Semantic Nets: slots, exceptions & default frames, conceptual dependency, scripts.	
Module III :	20%
Handling uncertainty on-Monotonic Reasoning, Probabilistic reasoning, use of certainty factors, fuzzy logic.	
Module IV :	20%
Learning: Concept of learning, learning automation, genetic algorithm, learning by inductions, neural net	
Module V:	20%
Expert Systems: Need & justification for Expert Systems, knowledge acquisition, Case Studies: MYCIN, RI.	
Lab	

Student Learning Outcomes:

1. Understand basics of problem solving skills.
2. Understand State Space Search problems. (hill climbing, heuristic search etc)
3. Understand knowledge representation techniques-search
4. Understand the relationship between monotonic and non monotonic reasoning
5. Understand advance learning techniques-search
6. Introduction to demonstration to Expert System to solve various problems

Pedagogy for Course Delivery: Nil

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
100	--	100

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					End Term Examination
Components (Drop down)	Attendance	Class Test	Assignment	Case Study	
Weightage (%)	5	10	5	10	70

Text Books

1. **E. Rich & K. Knight**, “Artificial Intelligence”, TMH, 2nd Edition, 1992.
2. **N.J. Nilsson**, “Principles of AI”, Narosa Publications House, 1990.

Reference Books:

1. **D.W. Patterson**, “Introduction to AI & Expert Systems”, PHI, 1992.
2. **Peter Jackson**, “Introduction to Expert Systems”, AWP, M.A., 1992.
3. **R.J. Schalkoff**, “Artificial Intelligence - An Engineering Approach”, McGraw Hill International Edition, Singapore, 1992.
4. **M. SasiKumar, S. Ramani**, “Rule Based Expert Systems”, Narosa Publishing House, 1994.