



Subject Code	SUBJECT NAME	L	T	P	C
	<b>Artificial Intelligence and Expert Systems</b>	3	0	0	3

#### **Course Educational Objectives**

CEO 01	To understand Basic Concepts of Artificial Intelligence and Expert Systems.
CEO 02	To provide knowledge on Various Techniques and Tools involved in Artificial Intelligence.
CEO 03	Explain about AI techniques for knowledge representation, planning and uncertainty Management.

**Course Outcomes: : Upon successful completion of this course, students should be able to:**

CO 01	Understand the Basics about Artificial Intelligence and Expert Systems.
CO 02	Understand the Programming Logics in Artificial Intelligence.
CO 03	Develop knowledge of decision making and learning methods
CO 04	Demonstrate the latest developments in Knowledge systems and Tools.
CO 05	Describe the use of AI to solve NLP problems.
CO 06	Understand the Knowledge about the Expert Systems.

#### **CO-PO & PSO Mapping ( Articulation Matrix):**

COs	PROGRAMME OUTCOMES												PSOs	
	01	02	03	04	05	06	07	08	09	10	11	12	01	02
01	3	1	2											
02	3	2	3											
03	2	3	2											
04	3	3	2	3										
05	3	3	3											
06	3	2	2											
Avg.	2.83	2.33	2.33	3										

#### **Justification of the Mapping:**

CO	PO	Level	Justification
1	1	3	It has the highest significance
	2	1	It has the least significance
	3	2	It has an average significance
2	1	3	It has the highest significance
	2	2	It has an average significance
	3	3	It has the highest significance
3	1	2	It has an average significance
	2	3	It has the highest significance
	3	2	It has an average significance
4	1	3	It has the highest significance
	2	3	It has the highest significance
	3	2	It has an average significance
	4	3	It has the highest significance
5	1	3	It has the highest significance



	2	3	It has the highest significance
	3	3	It has the highest significance
6	1	3	It has the highest significance
	2	2	It has an average significance
	3	2	It has an average significance

### **Syllabus**

<b>UNIT I</b>	10 Hours
<b>Introduction to AI:</b> What is Artificial Intelligence? AI Technique, Types of AI ( Strong AI & Weak AI), Agents and Environments, Level of the Model, Problem Spaces, and Search: Defining the Problem as a State Space Search-Water Jug Problem, Production Systems, Problem Characteristics, Production System Characteristics, and Issues in the Design of Search Programs.	
<b>UNIT II</b>	08 Hours
<b>Knowledge Representation:</b> Representations and Mappings, Approaches to Knowledge Representation.	
<b>Using Predicate Logic:</b> Representing Simple Facts in Logic, Representing Instance and ISA Relationships, Computable Functions and Predicates, Resolution, Natural Deduction.	
<b>Using Rules:</b> Procedural Versus Declarative Knowledge, Logic Programming, Forward Versus Backward Reasoning, Matching, Control Knowledge.	
<b>Symbolic Reasoning Under Uncertainty:</b> Introduction to Non monotonic Reasoning, Logics for Non monotonic Reasoning, Implementation Issues, Augmenting a Problem-solver, Depth-first Search, and Breadth-first Search.	
<b>UNIT III</b>	08 Hours
<b>Game Playing:</b> The Mini-max Search Procedure, Adding Alpha-beta Cutoffs, Iterative Deepening.	
<b>Planning:</b> The Blocks World, Components of a Planning System, Goal Stack Planning, Nonlinear Planning Using Constraint Posting, Hierarchical Planning, Other Planning Techniques.	
<b>Understanding:</b> What is Understanding, What Makes Understanding Hard?, Understanding as Constraint Satisfaction.	
<b>UNIT IV</b>	08 Hours
<b>Natural Language Processing:</b> Introduction, Syntactic Processing, Semantic Analysis, Discourse and Pragmatic Processing, Statistical Natural Language Processing, Spell Checking.	
<b>Learning:</b> Rote Learning, Learning by Taking Advice, Learning in Problem-solving, Learning from Examples: Induction, Explanation-based Learning, Discovery, Analogy, Formal Learning Theory, Neural Net Learning and Genetic Learning.	
<b>UNIT V</b>	08 Hours
<b>Expert Systems:</b> Architecture and Roles of Expert System-Typical Expert System Representing and Using Domain Knowledge, Expert System Shells, Explanation, Knowledge Acquisition.	
<b>Teaching Methods:</b> Chalk& Board/ PPT/Video Lectures/Lecture by Industry Expert/MOOCs	



**Text Books:**

1. *Elaine Rich, Kevin Knight & Shivashankar BNair, Artificial Intelligence, McGrawHill, 3rd ed., 2009*
2. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 3rd Edition, Pearson Education / Prentice Hall of India, 2010.
3. Joseph C. Giarratano, Gary D. Riley, "Expert Systems: Principles and Programming", 4th Edition, 2015

**Reference Book:**

1. *SKaushik, Artificial Intelligence, CengageLearning, 1sted.2011*
2. *IntroductiontoArtificialIntelligence&ExpertSystems, DanWPatterson, PHI., 2011*
3. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
4. Janakiraman, K. Sarukesi, 'Foundations of Artificial Intelligence and Expert Systems', Macmillan Series in Computer Science, 2000.