

22EEPE33		ARTIFICIAL INTELLIGENCE AND COMPUTER VISION		SEMESTER VIII			
PREREQUISITES			CATEGORY	PE	Credit		3
Soft computing			Hours/Week	L	T	P	TH
			3	0	0	0	3
<b>Course Objectives:</b>							
1	To understand the various characteristics of Intelligent agents						
2	To learn the different search strategies in AI						
3	To learn to represent knowledge in solving AI problems						
4	To understand the different ways of designing software agents						
5	To know about the various applications of AI						
6	To provide introduction to computer vision						
<b>Unit I</b>	<b>INTRODUCTION</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Introduction-Definition – Future of Artificial Intelligence – Characteristics of Intelligent Agents – Typical Intelligent Agents – Problem Solving Approach to Typical AI problems.							
<b>Unit II</b>	<b>PROBLEM SOLVING METHODS</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Problem solving Methods – Search Strategies – Uninformed – Informed – Heuristics – Local Search Algorithms and Optimization Problems – Searching with Partial Observations – Constraint Satisfaction Problems – Constraint Propagation – Backtracking Search – Game Playing – Optimal Decisions in Games – Alpha – Beta Pruning – Stochastic Games							
<b>Unit III</b>	<b>KNOWLEDGE REPRESENTATION</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
First Order Predicate Logic – Prolog Programming – Unification – Forward Chaining – Backward Chaining – Resolution – Knowledge Representation – Ontological Engineering – Categories and Objects – Events – Mental Events and Mental Objects – Reasoning Systems for Categories – Reasoning with Default Information							
<b>Unit IV</b>	<b>SOFTWARE AGENTS AND AI APPLICATIONS</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
Architecture for Intelligent Agents – Agent communication – Negotiation and Bargaining – Argumentation among Agents – Trust and Reputation in Multi-agent systems.							
AI applications: Language Models – Information Retrieval – Information Extraction – Natural Language Processing – Machine Translation – Speech Recognition – Robot – Hardware – Perception – Planning – Moving.							
<b>Unit V</b>	<b>COMPUTER VISION</b>			<b>9</b>	<b>0</b>	<b>0</b>	<b>9</b>
<b>Digital Image Processing:</b> Image formation –image filtering- Edge detection- principal component analysis-corner detection – SIFT –Large scale image search application							
<b>Geometric techniques in computer vision:</b> Image transformations – Camera projections- camera calibration – Depth from stereo – two view structure from motion- object tracking							
<b>Machine learning for computer vision:</b> introduction to machine learning-Image classification – object detection – semantic segmentation							
<b>Total (45L+0T)=45 Periods</b>							

<b>Text Books:</b>	
1.	S. Russel and P. Norvig, “Artificial Intelligence: A Modern Approach”, Prentice Hall, Third Edition, 2009.
2.	I. Bratko, “Prolog: Programming for Artificial Intelligence”, Fourth Edition, Addison-Wesley Education Publishers Inc., 2011.
3	David A. Forsyth and Jean Ponce, “Computer Vision: A Modern Approach”, Pearson Publications, Second Edition, 2012.
4	Richard Hartley and Andrew Zisserman, ”Multiple View Geometry in Computer Vision”, Cambridge University Press , Second Edition, 2004.
<b>Reference Books:</b>	

1	M. Tim Jones,” Artificial Intelligence: A systems Approach (Computer science)”, Jones and Bartlett Publishers Inc., First Edition, 2008.
2	Nils J.Nilsson,” The Quest for Artificial Intelligence”, Cambridge University Press, 2009.
3	William F. Clocksin and Christopher S. Mellish, “Programming in Prolog: Using ISO standard”, Fifth Edition, Springer , 2003.
4	Gerhard Weiss, “ Multi Agent systems”, Second Edition, MIT Press, 2013.
5	David L. Poole and Alan K.Mackworth, “Artificial Intelligence: Foundations of Computational Agents”, Cambridge University Press 2010.

<b>Course Outcomes:</b>		<b>Bloom’s Taxonomy Mapped</b>
Upon completion of this course, the students will be able to:		
CO1	: Choose appropriate search algorithms for any AI problem	L5: Evaluating
CO2	: Represent a problem using first order and predicate logic	L2: Understanding
CO3	: Provide the apt agent strategy to solve a given problem	L4: Analyzing
CO4	: Design software agents to solve a problem and applications for NLP that use Artificial Intelligence.	L6: Creating
CO5	: Use AI techniques in computer vision	L3: Applying

<b>COURSE ARTICULATION MATRIX</b>															
COs/ POs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO1	3				3						1		1		1
CO2	2	3	1	2	3								3	2	
CO3	2		1	2	3								2	3	
CO4	2		3	2	3						1		2	3	1
CO5	2		3	2	3						1		2	3	1
<b>Avg</b>	2.2	3	2	1.6	3	0	0	0	0	0	1	0	2	2.7 5	1
3/2/1-indicates strength of correlation (3- High, 2-Medium, 1- Low)															