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DEPARTMENT OF COMPUTER SCIENCE AND ENGIEERING

COURSE PLAN

Subject code: CS8691	**Branch/Year/Sem:CSE/III/VI**
Subject Name: ARTIFICIAL INTELLIGENCE	**Batch:2017-2021**
Staff Name: R.PADMAVATHI	**Academic year:2019-2020(EVEN)**

COURSE OBJECTIVE

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.

TEXT BOOK:

T1: S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach‖, Prentice Hall, Third Edition, 2009.
T2: I. Bratko, ―Prolog: Programming for Artificial Intelligence‖, Fourth edition, Addison-Wesley Educational Publishers Inc., 2011..

REFERENCES:

R1. M. Tim Jones, ―Artificial Intelligence: A Systems Approach(Computer Science)‖, Jones and Bartlett Publishers, Inc.; First Edition, 2008

R2. Nils J. Nilsson, ―The Quest for Artificial Intelligence‖, Cambridge University Press,2009.

R3. William F. Clocksin and Christopher S. Mellish,‖ Programming in Prolog: Using the ISO Standard‖, Fifth Edition, Springer, 2003.

R4. Gerhard Weiss, ―Multi Agent Systems‖, Second Edition, MIT Press, 2013.

R5. David L. Poole and Alan K. Mackworth, ―Artificial Intelligence: Foundations of Computational Agents‖, Cambridge University Press, 2010.

WEB RESOURCES

W1:http://aimaterials.blogspot.com/p/blog-page_3.html
(UNIT 1,2)
W2: https://www.slideshare.net/AfifAlMamun/artificial-intelligence-presentation-64343907
(TOPIC NO: 22,32,37,38)

TEACHING METHODOLOGIES:

- BB - BLACK BOARD
- PPT - POWER POINT PRESENTATION

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CS8691 ARTIFICIAL INTELLIGENCE **L T P C**
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UNIT I INTRODUCTION **9**

Introduction–Definition – Future of Artificial Intelligence – Characteristics of Intelligent Agents–Typical Intelligent Agents – Problem Solving Approach to Typical AI problems.

UNIT II PROBLEM SOLVING METHODS **9**

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

UNIT III KNOWLEDGE REPRESENTATION **9**

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

UNIT IV SOFTWARE AGENTS **9**

Architecture for Intelligent Agents – Agent communication – Negotiation and Bargaining – Argumentation among Agents – Trust and Reputation in Multi-agent systems.

UNIT V APPLICATIONS **9**

AI applications – Language Models – Information Retrieval- Information Extraction – Natural Language Processing – Machine Translation – Speech Recognition – Robot – Hardware –Perception – Planning – Moving

TOTAL: 45 PERIODS

Topic No	Topic Name	Books For reference	Page No	Teaching Methodology	No of periods required	Cumulative periods
UNIT I	**INTRODUCTION**					
1.	Introduction–Definition	T1	1-5	BB	2	2
2.	Future of Artificial Intelligence	T1	5-16	BB	1	3
3.	Agents and environments	T1	34-36	BB	2	5
4.	Characteristics of Intelligent Agents	T1	36-40	BB	1	6
5.	Typical Intelligent Agents	T1	40-46	BB/PPT	2	8
6.	Problem Solving Approach to Typical AI problems	T1	64-69	BB	1	9
LEARNING OUTCOME: **At the end of unit , the students will be able to** • Determine and formulate a given A.I. problem that an Intelligent System must solve. • Understand the intelligent agents and its types. • Use appropriate Intelligent agent for any AI problem						
UNIT II	**PROBLEM SOLVING METHODS**					**(9)**
10.	Problem solving Methods	T1	75-81	BB	1	10
11.	Search Strategies- Uninformed	T1	81-92	BB	2	12
12.	Informed- Heuristics	T1	92-102	BB/PPT	1	13
13.	Local Search Algorithms and Optimization Problems	T1	108-120	BB	1	14
15.	Constraint Satisfaction Problems- Constraint Propagation	T1	202-208	BB	1	15
16.	Backtracking Search	T1	208-214	BB	1	16
17.	Game Playing- Optimal Decisions in Games	T1	161-163	BB	1	17
18.	Alpha – Beta Pruning – Stochastic Games	T1	167-177	BB	1	18
LEARNING OUTCOME: **At the end of unit , the students will be able to** • Use appropriate search algorithms for any AI problem • Describe the role of heuristics and solve various types of search problems.						
UNIT – III	**KNOWLEDGE REPRESENTATION**					**(9)**
19.	First Order Predicate Logic	T1	285-300	BB	1	19
20.	Prolog Programming- Unification	T1	315-325	BB	1	20
21.	Forward Chaining-Backward Chaining	T1	330-337	BB/PPT	1	21
22.	Resolution	T1	337-345	BB/PPT	1	22

23.	Knowledge Representation – Ontological Engineering	T1	437	BB	1	23
24.	Categories and Objects	T1	440-446	BB	1	24
25.	Events – Mental Events and Mental Objects	T1	446-453	BB	1	25
26.	Reasoning Systems for Categories	T1	453-458	BB	1	26
27.	Reasoning with Default Information	T1	458-462	BB	1	27

LEARNING OUTCOME:

At the end of unit , the students will be able to

- Represent a problem using first order logic
- Describe the role of heuristics and solve various types of search problems.
- Describe the categories of objects and different reasoning systems

UNIT IV	**SOFTWARE AGENTS**					**(9)**
28.	Architecture for Intelligent Agents	T1	480-483	BB	2	29
29.	Agent communication	T1	485-495	BB	2	31
30.	Negotiation and Bargaining	T1	501-510	BB	2	33
31.	Argumentation among Agents	T1	510-514	BB	1	34
32.	Trust and Reputation in Multi-agent systems.	T1	518-522	BB/PPT	2	36

LEARNING OUTCOME:

At the end of unit , the students will be able to

- Illustrate the complications of planning and intelligent agents acting in the Real world.
- Provide the agent strategy to solve a given problem.
- Describe about different multi agent systems

UNIT V	**APPLICATIONS**					**(9)**
37.	AI applications – Language Models	T1	860-865	BB/PPT	1	37
38.	Information Retrieval- Information Extraction	T1	867-873	BB/PPT	2	39
39.	Natural Language Processing	T1	888-907	BB	1	40
40.	Machine Translation	T1	907-912	BB	1	41
41.	Speech Recognition	T1	912-918	BB/PPT	1	42
42.	Robot – Hardware	T1	973-978	BB	1	43
43.	Perception – Planning	T1	978-986	BB	1	44
44.	Moving	T1	997-1003	BB	1	45

LEARNING OUTCOME:

At the end of unit , the students will be able to

- **Design application s for NLP that use artificial intelligence**
- Demonstrate the fundamental concepts of machine learning
- Illustrate related algorithms in the applications of NLP and agent design.

COURSE OUTCOME

At the end of the course, the student should be able to:

- Use appropriate search algorithms for any AI problem
- Represent a problem using first order and predicate logic
- Provide the apt agent strategy to solve a given problem
- Design software agents to solve a problem
- Design applications for NLP that use Artificial Intelligence.

CONTENT BEYOND THE SYLLABUS

Expert systems in artificial intelligence

CONTINUES INTERNAL ASSESSMENT DETAILS

ASSESMENT NUMBER	I	II	MODEL
TOPIC NO.(UNIT)	1-18 (1st & 2nd units)	19-32 (3rd & 4th units)	1-44 (units 1-5)

ASSIGNMENT DETAILS

ASSIGNMENT NUMBER	I	II	III
TOPIC NUMBER FOR REFERENCE	1-18 (1st & 2nd units)	19-32 (3rd & 4th units)	1-42 (units 1-5)
DEAD LINE			

ASSIGNMENT NUMBER	BATCH	DESCRIPTIVE QUESTIONS/TOPIC (Minimum of 8 Pages)
I	81511810001-815118104055	1.Discuss in detail about different types of intelligent agents 2.Illustrate the BFS & DFS search algorithms 3.Discuss in detail about the aplha-beta pruning process
II	81511810001-815118104055	1.Explain in detail about the forward and backward chaining process 2.Illustrate the necessary example for resolution process 3.Outline the architecture of intelligent agents
III	81511810001-81511810405	1. Demonstrate Natural Language Processing in detail 2. Explain in detail about .Machine translation

PREPARED BY **VERIFIED BY**

R.PADMAVATHI, AP/CSE **HOD/CSE**

APPROVED BY

PRINCIPAL