



SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Information Technology		LP: IT16503
B.E/B.Tech/M.E/M.Tech : B.Tech		Rev. No: 00
Regulation: 2016		Date:
PG Specialisation	: --	29/06/2018
Sub. Code / Sub. Name	: IT16503 – COMPUTATIONAL INTELLIGENCE	
Unit	: I	

PROBLEM SOLVING METHODS

Unit Syllabus: Problems, Problem Spaces and Search - problem characteristics -production system characteristics-Heuristic Search Techniques – Generate and Test- Hill Climbing- Best First Search- Problem Reduction-Constraint Satisfaction Problems – Game Playing – Minimax procedure - Alpha-Beta Pruning

Objective:

- To understand the concepts of Artificial Intelligence
- To learn the methods of solving problems using Artificial Intelligence

Session No *	Topics to be covered	Ref	Teaching Aids
1	Introduction to AI - Problem Formulation : Defining the Problem as a state space search for Water Jug problem	1 - Ch 1 ; Pg 1 – 30 3- Ch 1; Pg 1-7	LCD
2	Problem characteristics	1 - Ch 1 ; Pg 36-43	LCD
3	Production System and its Characteristics	1 - Ch 2 ; 30 – 36,40-43	LCD
4	Heuristic Search Techniques : Generate-and-Test, Hill Climbing and its variants and Simulated	1 - Ch 3 : Pg 50 – 57 6 – Ch 4; Pg 111-115	BB/ LCD
5	Best-First Search : OR Graphs	1 - Ch 3; Pg 57-59	BB/ LCD
6	Best-First Search : A* algorithm	1 - Ch 3; Pg 59 – 64 6 - Ch 4 ; 95 – 100	BB/ LCD
7	Problem Reduction : AND-OR graphs, AO* algorithm	1 - Ch 3; Pg 64 – 68	BB/ LCD
8	Constraint satisfaction Problem: Cryptarithmic problem	1 - Ch 3; Pg 68-72 6 - Ch 5 ; 137 – 141	BB/ LCD
9	Game playing : Overview, Minimax search procedure, Alpha-beta pruning	1 - Ch 12; Pg 231 – 240 6 -Ch 6; 165 & 167-171	BB/ LCD
10	Tutorial on Cryptarithmic problem		BB/ LCD
11	Tutorial on Game playing		BB/ LCD
12	Tutorial on alpha-beta pruning		BB/ LCD

Content beyond syllabus covered (if any):

* Session duration: 50 minutes



Sub. Code / Sub. Name: IT16503 – COMPUTATIONAL INTELLIGENCE

Unit : II

KNOWLEDGE REPRESENTATION

Unit Syllabus : Knowledge representation-Using Predicate logic- Representing Simple Facts- Representing Instance – Computable Functions and Predicates -Resolution, Knowledge Inference – Backward chaining, Forward chaining

Objective:

- To represent knowledge for problem solving using various logic
- To infer knowledge using various techniques

Session No *	Topics to be covered	Ref	Teaching Aids
13	Knowledge Representation Issues : Representations and Mappings	1 - Ch 4 ; Pg 79 –82	LCD
14	Approaches to Knowledge representation	1 - Ch 4 ; Pg 82-86	LCD
15	Knowledge representation using Predicate logic	1 - Ch 5 ; Pg 98 – 99	BB/ LCD
16	Representing simple facts in logic	1 - Ch 5 ;Pg 99-103 3- Ch 4; Pg 49-60	BB/ LCD
17	Representing Instance and ISA relationships	1 - Ch 5 ; Pg 103-105	BB/ LCD
18	Computable Functions and Predicates	1 - Ch 5 ; Pg 105-108	BB/ LCD
19	Predicate logic : Resolution	1 - Ch 5 ; Pg 108-124 6 – Ch 9; Pg 295-306	BB/ LCD
20	Knowledge Inference using Forward chaining	6 – Ch 9; Pg 280-287	BB/ LCD
21	Knowledge Inference using Backward chaining	6 – Ch 9; Pg 287-290	BB/ LCD
22	Tutorial on Predicate logic		BB/ LCD
23	Tutorial on Resolution		BB/ LCD
24	Tutorial on Knowledge Inference		BB/ LCD

Content beyond syllabus covered (if any):



Sub. Code / Sub. Name: IT16503 – COMPUTATIONAL INTELLIGENCE

Unit : III

DATA MINING

Unit Syllabus: Fundamentals – Data reduction – Classification - Decision tree Induction – Learning - Supervised Learning –Unsupervised Learning – Reinforcement Learning –Associations- Frequent Itemset Mining Methods, Clustering- Partitioning methods - Hierarchical methods- Data Mining Applications

Objective:

- To understand the fundamentals and various concepts of data mining.

Session No *	Topics to be covered	Ref	Teaching Aids
25	Fundamentals- Type of data, Pattern types, technologies	2 - Ch 1; Pg 1-21	LCD
26	Data reduction-Wavelet Transforms, PCA, Regression, Histograms, Sampling	2 - Ch 3; Pg 99-111	LCD
27	Classification - Decision tree Induction- Attribute Selection, Tree Pruning	2 - Ch 8; Pg 330-350	BB/ LCD
28	Learning - Supervised Learning –Unsupervised Learning	Internet	LCD
29	Reinforcement Learning	Internet	LCD
30	Associations- Frequent Itemset Mining Methods- Apriori algorithm	2 - Ch 6; Pg 248-264	BB/ LCD
31	Clustering- Partitioning methods- k-Means, k-Medoids	2 - Ch 10; Pg 451-457	LCD
32	Clustering- Hierarchical methods- Agglomerative, BIRCH, Chameleon	2 - Ch 10; Pg 457-470	BB/ LCD
33	Data Mining Applications	2 - Ch 13; Pg 607-618	LCD
34	Tutorial on Classification		BB/ LCD
35	Tutorial on Associations		BB/ LCD
36	Tutorial on Clustering		BB/ LCD

Content beyond syllabus covered (if any):



Sub. Code / Sub. Name: IT16503 – COMPUTATIONAL INTELLIGENCE

Unit : IV

EXPERT SYSTEMS

Unit Syllabus : Expert systems - Architecture of expert systems, Roles of expert systems - Knowledge Acquisition –Meta knowledge, Heuristics. , Expert systems shells- Typical expert systems - MYCIN, DART, XCON

Objective:

- To introduce the concepts of Expert Systems with case studies for various applications.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Expert systems : Introduction and Characteristics	3- Ch 15; Pg 326-330	LCD
38	Architecture of expert systems	3 - Ch 15 ;Pg 330 – 347	LCD
39	Roles of expert systems	3- Ch 15; Pg 326-330	LCD
40	Knowledge Acquisition- Meta knowledge, Heuristics	1- Ch 20; Pg 427- 429	LCD
41	Expert systems shells	1- Ch 20; Pg 424 – 427	LCD
42	Architecture of MYCIN Expert system	3- Ch 15; Pg 326-330	LCD
43	Knowledge Acquisition in MYCIN Expert	Internet	LCD
44	Architecture and Knowledge Acquisition of DART Expert system	Internet	LCD
45	Architecture and Knowledge Acquisition of XCON Expert system	3- Ch 15; Pg 326-330	LCD
46	Tutorial on Expert systems		BB/ LCD
47	Tutorial on MYCIN		BB/ LCD
48	Tutorial on DART, XCON		BB/ LCD

Content beyond syllabus covered (if any): Deep learning

* Session duration: 50 mins



Sub. Code / Sub. Name: IT16503 – COMPUTATIONAL INTELLIGENCE

Unit : V

ADVANCED TOPICS

Unit Syllabus : Evolutionary Computation- Genetic Algorithms –Crossover- Mutation, Genetic programming ; Evolutionary Programming- Operators- Parameters- Implementations; Neural Networks – Multi layer Feed Forward Neural Network-Applications of Neural Networks- Fuzzy Systems- Fuzzy Sets – Fuzzy Logic and Reasoning – Creating a bot – Weather Monitoring bot

Objective:

- To introduce the advanced concepts of Computational Intelligence

Session No *	Topics to be covered	Ref	Teaching Aids
49	Evolutionary Computation - Introduction	4 – Ch 8; Pg 127-141	LCD
50	Genetic Algorithms –Crossover- Mutation	4 – Ch 9; Pg 143-156	LCD
51	Genetic programming	4 – Ch 10; Pg 177-184	LCD
52	Evolutionary Programming- Operators- Parameters- Implementations	4 – Ch 10; Pg 187-206	LCD
53	Neural Networks – Multi layer Feed Forward Neural Network	6- Ch 20; Pg 744-748	LCD
54	Applications of Neural Networks	1- Ch 18; Pg 396-399	LCD
55	Fuzzy Systems- Fuzzy Sets	4 – Ch 20; Pg 453-463	LCD
56	Fuzzy Logic and Reasoning	4 – Ch 21; Pg 465-472	LCD
57	Creating a bot – Weather Monitoring bot	5	LCD
58	Tutorial on Genetic Algorithms		BB/ LCD
59	Tutorial on Neural Networks		BB/ LCD
60	Tutorial on Fuzzy Systems		BB/ LCD

Content beyond syllabus covered (if any):


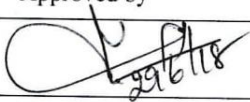
* Session duration: 50 mins



Sub. Code / Sub. Name: IT16503 – COMPUTATIONAL INTELLIGENCE

REFERENCES:

1. Kevin Night and Elaine Rich, Nair B., “Artificial Intelligence (SIE)”, McGraw Hill- 2008.
2. Jiawei Han and Micheline Kamber, “Data Mining Concepts and Techniques”, Third Edition, Elsevier, 2012.
3. Dan W. Patterson, “Introduction to AI and ES”, Pearson Education, 2007.
4. Andries .P. Engelbrecht, Computational Intelligence: An Introduction, 2nd Edition, John Wiley & Sons, 2012
5. https://en.wikipedia.org/wiki/Wikipedia:Creating_a_bot
6. S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, Prentice Hall, 3rd Edition, 2009

	Prepared by	Approved by
Signature		
Name	P.Sharon Femi	Dr.V.Vidhya
Designation	Assistant Professor	Professor & HOD i/c
Date	29.06.2018	29.06.2018
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD