



# Bharath

INSTITUTE OF HIGHER EDUCATION AND RESEARCH

(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)



**BHARATH INSTITUTE OF SCIENCE AND TECHNOLOGY**

No.173, Agharam Road, Selaiyur, Chennai , T.N - 600 073.

## Requisition Letter

From  
Dr. K.P Kaliyamurthie  
Professor & Head,  
Department of CSE,  
Bharath Institute of Higher Education and Research,  
Chennai

Date: 21.03.2019

To  
The Dean Engineering,  
Bharath Institute of Higher Education and Research,  
Chennai

Respected sir,

Subject : Request of Permission to conduct a value added course on “**Artificial Intelligence Search Methods for Problem Solving**” -Reg

With reference to above subject, I would like to bring to your kind notice that, our department interested to organize value added course on “**Artificial Intelligence Search Methods for Problem Solving**” in our campus premises from 28.03.2019 for 30 hours

Our internal Professors would deliver lecture for the above mentioned course. About 45 students would be participating in this course. We request you kindly to give permission to organize this.

Venue: **CSE Class room**

Timing : 4:00 PM to 6:00 PM Monday (AN) and

4:00 PM to 6:00 PM Thursday (AN) and

4:00 PM to 6:00 PM Friday (AN)

Submitted to Principal for approval to organize this value added course.

**HOD/CSE**

HEAD OF DEPARTMENT  
Department of Computer Science & Engg.,  
Bharath Institute of Higher Education & Research  
(Declared as Deemed to be University U/S 3 of UGC Act, 1956)  
Chennai-600 073, INDIA

**DEAN ENGINEERING**





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## CIRCULAR

25.03.2019

The School of computing, Bharath Institute of Higher Education and Research is planned to conduct a certification value added course on **Artificial Intelligence Search Methods for Problem Solving** for the benefit of II, III and IV year students. This course is scheduled from 28.03.2019 for 30 hours which includes theory and practical. The timings are 4.00 PM to 6.00 PM on Monday, Thursday and Friday.

All Registered Students must attend all the classes without fail. The following faculty members are assigned to handle the course. S.NO	Name of the Faculty	Designation
1	Dr. Nalini	Professor
2	Dr. Rajabhushnam	Professor



**Head of The Department**

To

Copy to CSE

Copy to IT

HEAD OF DEPARTMENT  
Department of Computer Science & Engg.,  
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Chennai-600 073, INDIA





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## **CERTIFICATE COURSE ON ARTIFICIAL INTELLIGENCE SEARCH METHODS FOR PROBLEM SOLVING**

**Date of Introduction of the Course: 28.03.2019**

### **COURSE SYLLABUS**

#### **1. Introduction**

History, Can Machines think?, Turing Test, Winograd Schema Challenge, Language and Thought, Wheels & Gears.

#### **2. Overview**

Philosophy, Mind, Reasoning, Computation, Dartmouth Conference, The Chess Saga, Epiphenomena.

#### **3. State Space Search**

Depth First Search, Breadth First Search, Depth First Iterative Deepening.

#### **4. Heuristic Search**

Best First Search, Hill Climbing, Solution Space.

#### **5. Advanced Heuristic Based methods**

TSP, Escaping Local Optima, Stochastic Local Search.

#### **6. Population Based Methods.**

Genetic Algorithms, SAT, Emergent Systems, Ant Colony Optimization.

#### **7. Finding Optimal Paths**

Branch & Bound, A\*, Admissibility of A\*, Informed Heuristic Functions.

#### **8. Space Saving Versions of A\***

Weighted A\*, IDA\*, RBFS, Monotone Condition, Sequence Alignment, DCFS, SMGS, Beam Stack Search.

#### **9. Game Playing**

Game Theory, Board Games and Game Trees, Algorithm Minimax, AlphaBeta and SSS\*.



## **10. Automated Planning**

Domain Independent Planning, Blocks World, Forward Search.

## **11. More Automated Planning Methods**

Backward Search, Goal Stack Planning, Plan Space Planning.

## **12. Problem Decomposition**

Means Ends Analysis, Algorithm Graphplan, Algorithm AO\*.

## **13. Rule Based Expert Systems**

Production Systems, Inference Engine, Match-Resolve-Execute, Rete Net.

## **14. Deduction as Search**

Logic, Soundness, Completeness, First Order Logic, Forward Chaining, Backward Chaining.

## **15. Constraint Processing**

CSPs, Consistency Based Diagnosis, Algorithm Backtracking, Arc Consistency, Algorithm Forward Checking.

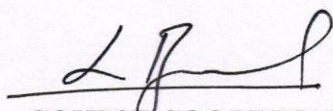
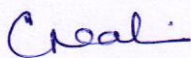
## **COURSE OBJECTIVES**

In this course we plan to give students an overview of the Artificial Intelligence Search Methods for Problem Solving in the field of Computer Science and Information Technology, and an in-depth study into algorithms and search methods. Students will gain hands-on experience solving relevant problems through projects. It is our objective that students will develop the skills needed to carry out research projects in this domain.

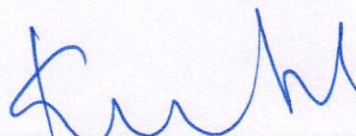
**Specifically, the course has the following objectives:**

**Students will learn**

1. The notions of state space representation, heuristic search along with the time and space complexities .
2. The different planning methods.
3. The applications of AI: namely Game Playing and Expert Systems.



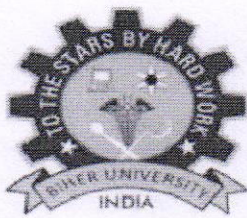
**COURSE COORDINATOR**



**HEAD OF THE DEPARTMENT**

HEAD OF DEPARTMENT  
Department of Computer Science & Engg.,  
Bharath Institute of Higher Education & Research  
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Chennai-600 073. INDIA





## **CERTIFICATE COURSE ON ARTIFICIAL INTELLIGENCE SEARCH METHODS FOR PROBLEM SOLVING**

**Date of Introduction of the Course: 28.03.2019**

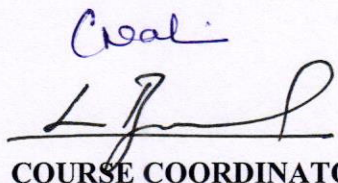
**The timings are 4:00 PM to 6:00 PM on Monday, Thursday and Friday**

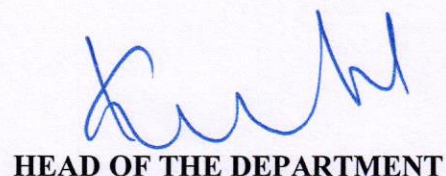
### **Time Table & Lesson plan**

<b>CLASS</b>	<b>DATE</b>	<b>TOPIC</b>
<b>1,2</b>	<b>28-03-2019(AN)</b>	<b>1. Introduction</b> History, Can Machines think?, Turing Test, Winograd Schema Challenge, Language and Thought, Wheels & Gears.
<b>3,4</b>	<b>29-03-2019(AN)</b>	<b>2. Overview</b> Philosophy, Mind, Reasoning, Computation, Dartmouth Conference, The Chess Saga, Epiphenomena.
<b>5,6</b>	<b>1-04-2019(AN)</b>	<b>3. State Space Search</b> Depth First Search, Breadth First Search, Depth First Iterative Deepening.
<b>7,8</b>	<b>4-04-2019(AN)</b>	<b>4. Heuristic Search</b> Best First Search, Hill Climbing, Solution Space.
<b>9,10</b>	<b>5-04-2019(AN)</b>	<b>5. Advanced Heuristic Based methods</b> TSP, Escaping Local Optima, Stochastic Local Search.
<b>11,12</b>	<b>8-04-2019(AN)</b>	<b>6. Population Based Methods.</b> Genetic Algorithms, SAT, Emergent Systems, Ant Colony Optimization.
<b>13,14</b>	<b>11-04-2019(AN)</b>	<b>7. Finding Optimal Paths</b> Branch & Bound, A*, Admissibility of A*, Informed Heuristic Functions.
<b>15,16</b>	<b>12-04-2019(AN)</b>	<b>8. Space Saving Versions of A*</b> Weighted A*, IDA*, RBFS, Monotone Condition, Sequence Alignment, DCFS, SMGS, Beam Stack Search.
<b>17,18</b>	<b>15-04-2019(AN)</b>	<b>9. Game Playing</b> Game Theory, Board Games and Game Trees, Algorithm Minimax, AlphaBeta and SSS*.
<b>19,20</b>	<b>18-04-2019(AN)</b>	<b>10. Automated Planning</b> Domain Independent Planning, Blocks World, Forward Search.
<b>21,22</b>	<b>19-04-2019(AN)</b>	<b>11. More Automated Planning Methods</b> Backward Search, Goal Stack Planning, Plan Space Planning.



23,24	22-04-2019(AN)	<b>12. Problem Decomposition</b> Means Ends Analysis, Algorithm Graphplan, Algorithm AO*.
25,26	25-04-2019(AN)	<b>13. Rule Based Expert Systems</b> Production Systems, Inference Engine, Match-Resolve-Execute, Rete Net.
27,28	26-04-2019(AN)	<b>14. Deduction as Search</b> Logic, Soundness, Completeness, First Order Logic, Forward Chaining, Backward Chaining.
29,30	29-04-2019(AN)	<b>15. Constraint Processing</b> CSPs, Consistency Based Diagnosis, Algorithm Backtracking, Arc Consistency, Algorithm Forward Checking.

  
COURSE COORDINATOR

  
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CERTIFICATE COURSE ON ARTIFICIAL INTELLIGENCE SEARCH METHODS FOR PROBLEM SOLVING

**Date of Introduction of the Course: 28.03.2019**

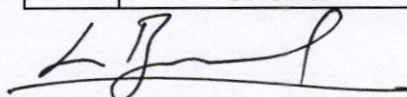
**School of Computing**

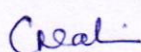
**Registered Students Name List**

S.NO	REG.NO	NAME OF THE STUDENT
1	U16CS012	FAYAZ AKIL S
2	U16CS013	SURYA SUNDARRAJ SRIRAM
3	U16CS014	SOMA BHARATH KUMAR
4	U16CS015	BJ JAISON
5	U16CS016	SARAVANAKUMAR S
6	U16CS017	VARUN KANNA A
7	U16CS018	JUPAKA SAIVARUN
8	U16CS019	PYDI VENKATA PRITHEESH NIHAR
9	U16CS020	R MAHESH
10	U16CS021	DHRUBAJYOTI MAJI
11	U16CS024	SRIMATHI S
12	U16CS025	SANTHOSHKUMAR S
13	U16CS026	AJAY KUMAR R
14	U16CS027	GARLAPATI RAGHURAM
15	U16CS028	PADILAM JAYANTH YADAV
16	U15CS044	DIVYA VANI T
17	U15CS045	DODDI PUJITHA
18	U15CS046	DOOLIGANTI AKHIL REDDY
19	U15CS047	DUPUGUNTLA BHANU SIVA KASINADH
20	U15CS048	GANDLUR REDDY GREESHMA



21	U15CS049	GANESH BAG
22	U15CS050	GANGARAJU RAHUL
23	U15CS051	GANGARAPU UKESH
24	U15CS052	GANGU BHAGYA
25	U15CS053	GLADSON J
26	U15CS054	GOLI SUDEEP KRISHNA
27	U15CS055	GOLLAPUDI KALYAN KUMAR
28	U15CS056	GORRE THIRUPATHI REDDY
29	U15CS057	GUJJETI MAHESH
30	U15CS058	GUNDA VINAY KUMAR
31	U14CS166	SHAFAN HASIM.N
32	U14CS167	SHAIK AATIKA
33	U14CS168	SHAIK MEERA SHARIF
34	U14CS169	SHAIK YASMIN
35	U14CS170	SHANKAR KUMAR GUPTA
36	U14CS171	SHARSHI KANT PRASAD
37	U14CS172	SHASHI BHUSHAN BHAGAT
38	U14CS173	SHEKH ADNAN NIYARIYA
39	U14CS174	SHIVANI GUPTA.M
40	U14CS175	SHUBHAM
41	U14CS176	SIREESHA.M
42	U14CS178	SK MD TAUQEER
43	U14CS179	SNEHA ROY
44	U14CS180	SABUJ BARMAN
45	U14CS181	SOURABH PRIYADARSHI

  
COURSE COORDINATOR



  
HEAD OF THE DEPARTMENT

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## CERTIFICATE OF PARTICIPATION

**This certificate is presented to**

SNEHA ROY

For actively participating in the value added course "Artificial Intelligence Search Methods for Problem Solving" Conducted by School of Computing, BIHER from 28.03.2019 to 29.04.2019.

*C. S. S. S.*

*[Signature]*  
COURSE COORDINATORS

*[Signature]*

HEAD OF THE DEPARTMENT

*[Signature]*

DIRECTOR



## COURSE FEEDBACK FORM

Academic Year		2019							
Term		Even							
Course Number									
Course Title		Artificial Intelligence Search Methods for problem solving							
Number of Credits									
Type of Course	Regular		Elective		Add-on				✓
<b>I. Information on the Respondent: (Tick (✓) Appropriately)</b>									
<b>1. Percentage of classes attended</b>									
0-20		20-40		40-60		60-80		80-100	✓
<b>2. Number of hours per week spent on the course (Other than lecture hours)</b>									
0-2		2-4		4-6		6-8	✓	8-10	
<b>3. Preparation for the course by the student:</b>									
(i)	Have done part of this course earlier ✓								
(ii)	Has adequate prior exposure to the prerequisites								
(iii)	Had to pickup relevant additional topics through concurrent study ✓								
(iv)	Have no exposure to the background material								
<b>4. The expectations for taking the course by the student are:</b>									
(a)	Enhance by skill base in the area of specializations ✓								
(b)	Get exposed to a relevant subject ✓								
(c)	Curiosity								
(d)	Better Employment Opportunity ✓								
(e)	Complete Course requirements								
(f)	To Improve CGPA								
<b>About the Instructor: Information on the Respondent: (Tick (✓) Appropriately)</b>									
		A	B	C	D	E			
1.	Pace of the Teaching/lecture				✓				
2.	Comment of the Subject			✓					
3.	Clarity of expression		✓						
4.	Level of preparation	✓							
5.	Level of interaction		✓						
6.	Accessibility outside the class		✓						
7.	Others (please specify)								
<b>A: Excellent</b>			<b>B: Very Good</b>		<b>C: Good</b>		<b>D: Satisfactory</b>		<b>E: Poor</b>

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## COURSE FEEDBACK FORM

Academic Year		2019					
Term		Even					
Course Number							
Course Title		Artificial Intelligence Search Methods for Problem Solving					
Number of Credits							
Type of Course	Regular		Elective		Add-on		✓

<b>I. Information on the Respondent: (Tick (✓) Appropriately)</b>									
1. Percentage of classes attended									
0-20		20-40		40-60		60-80		80-100	✓
2. Number of hours per week spent on the course (Other than lecture hours)									
0-2		2-4		4-6		6-8	✓	8-10	
3. Preparation for the course by the student:									
(i)	Have done part of this course earlier ✓								
(ii)	Has adequate prior exposure to the prerequisites								
(iii)	Had to pickup relevant additional topics through concurrent study ✓								
(iv)	Have no exposure to the background material ✓								
4. The expectations for taking the course by the student are:									
(a)	Enhance by skill base in the area of specializations ✓								
(b)	Get exposed to a relevant subject								
(c)	Curiosity								
(d)	Better Employment Opportunity ✓								
(e)	Complete Course requirements ✓								
(f)	To Improve CGPA								

About the Instructor: Information on the Respondent: (Tick (✓) Appropriately)					
	A	B	C	D	E
1. Pace of the Teaching/lecture		✓			
2. Comment of the Subject			✓		
3. Clarity of expression		✓			
4. Level of preparation	✓				
5. Level of interaction			✓		
6. Accessibility outside the class				✓	
7. Others (please specify)					

<b>A: Excellent</b>		<b>B: Very Good</b>		<b>C: Good</b>		<b>D: Satisfactory</b>		<b>E: Poor</b>	
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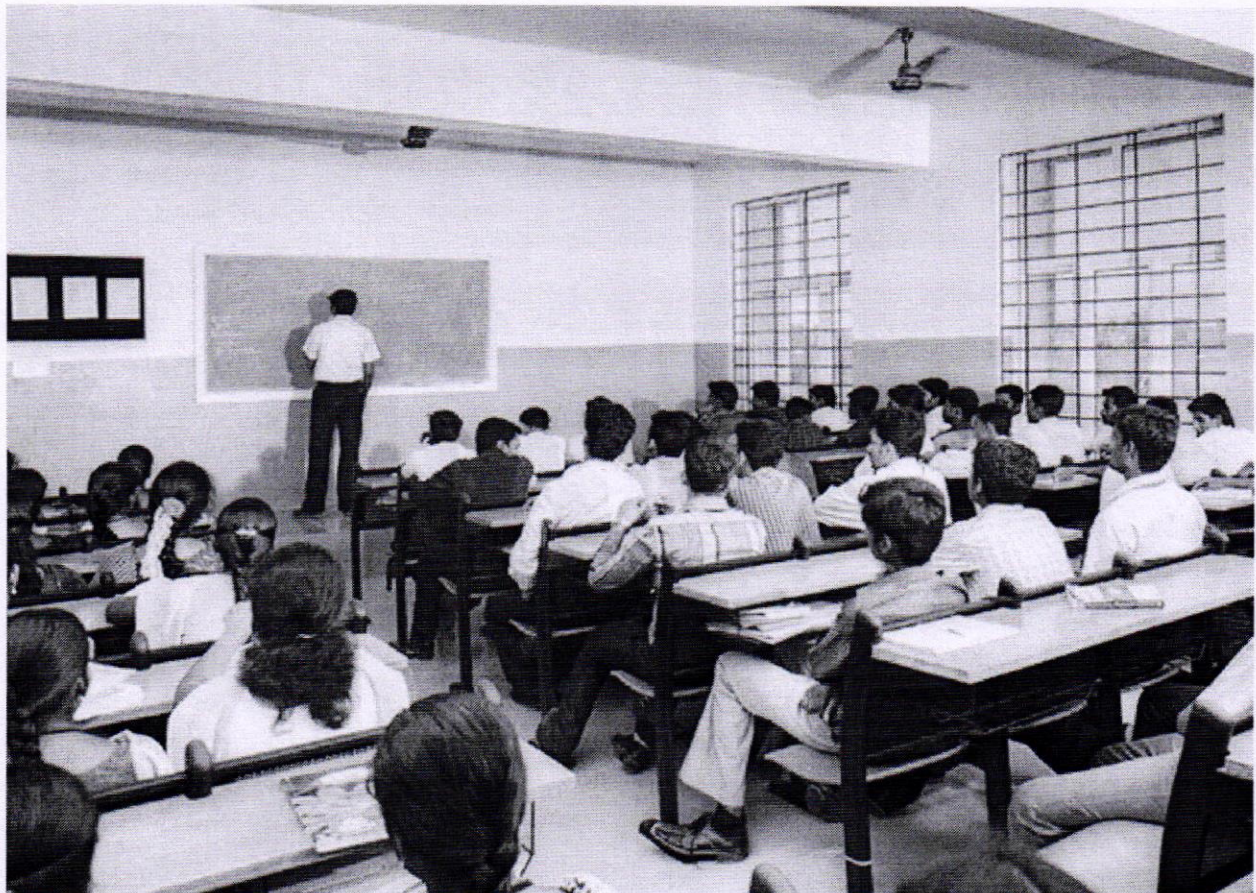


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*Creali*

*L. J. S.*  
**COURSE COORDINATOR**

*K. V. S.*

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