Bharath
INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed - to - be - University under section 3 of UGC Act 1956)

NAAC

BHARATH INSTITUTE OF SCIENCE AND TECHNOLOGY
No.173, Agharam Road, Selaiyur, Chennai , T.N - 600 073.

Requisition Letter

Date: 22.08.2022

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

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 **"IBM AI Engineering"** - 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 **"IBM AI Engineering"** in our campus premises on **28/08/2022**.

43 students would be participating in this course. We request you kindly to give permission to organize this event.

Venue: **CSE Smart Room**

Timing : **9 am to 4.30 pm**

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

HOD/CSE

DEAN ENGINEERING

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

CIRCULAR

25.08.2022

The School of computing, Bharath Institute of Higher Education and Research is planned to conduct a certification value added course on **IBM AI Engineering** for the benefit of II, III and IV year students. This course is scheduled from 28.08.2022 for 30 hours which includes theory and practical. The timings are 9:30 AM to 12:30 PM

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.C.Nalini	Professor
2	Mrs.C.Anuradha	Assistant Professor

Head of Department

To

Copy to CSE

Copy to IT

CERTIFICATE COURSE ON IBM AI ENGINEERING

Date of Introduction of the Course: 28.08.2022

COURSE SYLLABUS

1. Introduction: Philosophy of AI, Production systems

Introduction to AI-Problem formulation, Problem Definition, Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics, Specialized production system.

2. Modeling a Problem as Search Problem, Uninformed Search

Problem solving methods, Problem graphs, Uninformed Search, Divide and Conquer, Greedy, Branch and Bound, Gradient Descent.

3. Heuristic Search, Domain Relaxations

Informed Search, Pure Heuristic Search, Best First Search, A* Search, AO* Search.

4. Local Search, Genetic Algorithms

Local Search Algorithms and Optimization Problems, Hill-climbing search, Simulated annealing search, Local beam search, Genetic algorithms, Ant Colony Optimization, Tabu Search.

5. Adversarial Search

Adversarial Search, Game Types, Problem Formalization, Game Tree, Zero Sum Game.

6. Constraint Satisfaction

Searching with Partial Observations, Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search.

7. Game Playing

Game Playing, Optimal Decisions in Games, Min-Max Games, Alpha – Beta Pruning, Stochastic Games

8. Knowledge Representation

Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic, Structured representation of knowledge.

9. Knowledge Inference

Inference Rules, Production based system, Frame based system, Backward chaining, Forward chaining, Rule value approach.

10. Planning

Basic plan generation systems, Strips, Advanced plan generation systems, K strips, Strategic explanations, Why, Why not and how explanations.

11.Uncertainty in AI, Bayesian Networks

Fuzzy reasoning, Certainty factors, Bayesian Theory, Bayesian Network, Dempster – Shafer theory.

12.Markov Decision Processes

Markov Decision Processes, Dynamic programming, Linear programming, FMDP.

13. Expert Systems

Expert systems – Architecture, Roles of expert systems, Knowledge Acquisition, Meta knowledge, Typical expert systems, Expert systems shells.

14.Reinforcement Learning

RL Framework, Tabular methods, Q-networks, Policy Optimization, Model based RL.

15.Introduction to Deep Learning

Introduction to Tensorflow, Deep Neural Network, Recurrent neural networks, Convolutional neural networks, Applications.
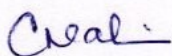
COURSE OBJECTIVES

In this course we plan to give students an overview of the field of Artificial Intelligence Engineering, and an in-depth study into its enabling technologies and main building blocks. Students will gain hands-on experience solving relevant problems through projects that will utilize existing public cloud tools. It is our objective that students will develop the skills needed to become a practitioner or carry out research projects in this domain.

Specifically, the course has the following objectives:

Students will learn

1) To have an appreciation for and understanding of both the achievements of AI and the theory underlying those achievements. To have an appreciation for the engineering issues underlying the design of AI systems.

2) To have a basic proficiency in a traditional AI language including an ability to write simple to intermediate programs and an ability to understand code written in that language.

3) To have an understanding of the basic issues of knowledge representation and blind and heuristic search, as well as an understanding of other topics such as minimax, resolution, etc. that play an important role in AI programs.

4) To have a basic understanding of some of the more advanced topics of AI such as learning, natural language processing, agents and robotics, expert systems, and planning.

COURSE COORDINATOR

HEAD OF THE DEPARTMENT

CERTIFICATE COURSE ON IBM AI ENGINEERING

Date of Introduction of the Course: 28.08.2022

The timings are 9:30 AM to 12:30 PM from Friday (AN) and Saturday (FN&AN).

Time Table & Lesson plan

CLASS	DATE	TOPIC
1,2	28-08-2022 (FN)	**1.Introduction: Philosophy of AI, Production systems** Introduction to AI-Problem formulation, Problem Definition, Production systems, Control strategies, Search strategies. Problem characteristics, Production system characteristics, Specialized production system.
3,4	01-09-2022 (FN) 02-09-2022 (FN)	**2. Modeling a Problem as Search Problem, Uninformed Search** Problem solving methods, Problem graphs, Uninformed Search, Divide and Conquer, Greedy, Branch and Bound, Gradient Descent.
5,6	02-09-2022 (AN) 08-09-2022 (FN)	**3. Heuristic Search, Domain Relaxations** Informed Search, Pure Heuristic Search, Best First Search, A* Search, AO* Search.
7,8	09-09-2022 (FN) 09-09-2022 (AN)	**4. Local Search, Genetic Algorithms** Local Search Algorithms and Optimization Problems, Hill-climbing search, Simulated annealing search, Local beam search, Genetic algorithms, Ant Colony Optimization, Tabu Search.
9,10	15-09-2022 (FN)	**5. Adversarial Search** Adversarial Search, Game Types, Problem Formalization, Game Tree, Zero Sum Game.
11,12	16-09-2022 (FN)	**6. Constraint Satisfaction** Searching with Partial Observations, Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search.
13,14	16-09-2022 (AN)	**Game Playing** Game Playing, Optimal Decisions in Games, Min-Max Games, Alpha – Beta Pruning, Stochastic Games

15,16	22-09-2022(FN) 23-09-2022(FN)	**8. Knowledge Representation** Knowledge representation using Predicate logic, Introduction to predicate calculus, Resolution, Use of predicate calculus, Knowledge representation using other logic, Structured representation of knowledge.
17,18	23-09-2022(AN)	**9. Knowledge Inference** Inference Rules, Production based system, Frame based system, Backward chaining, Forward chaining, Rule value approach
19,20	29-09-2022(FN)	**10. Planning** Basic plan generation systems, Strips, Advanced plan generation systems, K strips, Strategic explanations, Why, Why not and how explanations.
21,22	30-09-2022(FN)	**11. Uncertainty in AI, Bayesian Networks** Fuzzy reasoning, Certainty factors, Bayesian Theory, Bayesian Network, Dempster – Shafer theory.
23,24	30-09-2022(FN)	**12. Markov Decision Processes** Markov Decision Processes, Dynamic programming, Linear programming, FMDP.
25,26	30-09-2022(AN) 06-10-2022(FN)	**13. Expert Systems** Expert systems – Architecture, Roles of expert systems, Knowledge Acquisition, Meta knowledge, Typical expert systems, Expert systems shells.
27,28	07-10-2022(FN)	**14. Reinforcement Learning** RL Framework, Tabular methods, Q-networks, Policy Optimization, Model based RL.
29,30	07-10-2022(AN)	**15. Introduction to Deep Learning** Introduction to Tensorflow, Deep Neural Network, Recurrent neural networks, Convolutional neural networks, Applications.

COURSE COORDINATOR

HEAD OF THE DEPARTMENT

CERTIFICATE COURSE ON IBM AI ENGINEERING
Date of Introduction of the Course: 28.08.2022
School of Computing
Registered Students Name List

S.NO	REG.NO	NAME OF THE STUDENT
1	U15CS009	ANNADI DHANUSH
2	U15CS011	ANUMOLU YESWANTH
3	u15CS012	A sivavinaya
4	U15CS013	Aravindhan.KR
5	U15CS180	RAVURI SRIKANTH
6	U15CS182	RICHARD WUMBRAND J
7	U15CS183	S. PUNITHA
8	U15CS200	SITAROJ SRIKANTH
9	U15CS201	SMITHA C.S
10	U15CS202	SODISETTY SANDEEP
11	U15CS203	SUBASH CHANDRAN.V
12	U15CS204	SUBHAM RAY
13	U14CS024	ATUL ANAND
14	U14CS025	BACHU HARISH
15	U14CS026	BALA MURUGAN .P
16	U14CS029	BALAKRISHNAN.T
17	U14CS055	GOTTIPATI KARTHIK
18	U14CS702	S.KUMARAN
19	U14CS514	SATHISH RAJ
20	U14CS057	GOVIND KUMAR
21	U14CS058	HARI TEJA.G
22	U14CS059	HARISH.V
23	U14CS062	JERIPOTHULA SURESH GOUD
24	U14CS063	JOHN DALTON .H
25	U14CS064	K. LAKSHMIKANTH REDDY
26	U14CS067	KARTHICK.K
27	U14CS074	KESHAVAPRIYA .S

28	U14CS075	KEVIN ARNOLD THAKUR
29	U14CS080	KOVURI BALASUBHAKAR REDDY
30	U14CS082	KRISHNANDAN YADAV
31	U14CS086	LOKESHWARAN.A.
32	U14CS089	MADIYAL ANJAY
33	U14CS092	MANDELA SAIKIRAN
34	U14CS102	MOHAMMED AABID
35	U14CS104	MOLUGURI PRADEEP CHANDRA
36	U14CS109	N.UMA VENKATA MAHESHWARA SWAMY
37	U14CS222	M.GANESH RAJAN
38	U14CS503	ARJHUN KUMAR.K
39	U14CS508	INDHU GOPALAKRISHNAN
40	U14CS710	SHOPMINISTER
41	U14CS113	NALLAJARLA CHAKRADHAR
42	U14CS114	NANDALA SWETHA
43	U14CS115	NANDIPALLI MOUNICA

COURSE COORDINATOR   **HEAD OF THE DEPARTMENT**

CERTIFICATE COURSE ON IBM AI ENGINEERING

COURSE CO-ORDINATOR

HEAD OF THE DEPARTMEMNT

Bharath

INSTITUTE OF HIGHER EDUCATION AND RESEARCH
(Declared as Deemed-to-be University under section 3 of UGC Act 1956)

CERTIFICATE OF PARTICIPATION

This certificate is presented to

RAKESH KUMAR

For actively participating in the value added course "IBM AI Engineering" Conducted by School of Computing, BIHER from 28.08.2022 to 07.10.2022.

COURSE COORDINATORS

HEAD OF THE DEPARTMENT

DIRECTOR

COURSE FEEDBACK FORM

Academic Year	2022						
Term	Even						
Course Number							
Course Title	IBM AI Engineering						
Number of Credits							
Type of Course	Regular		Elective		Add-on	✓	

I. Information on the Respondent: (Tick (√) Appropriately)

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	Yes
(ii)	Has adequate prior exposure to the prerequisites	Yes
(iii)	Had to pickup relevant additional topics through concurrent study	Yes
(iv)	Have no exposure to the background material	Yes

4. The expectations for taking the course by the student are:

(a)	Enhance by skill base in the area of specializations	Yes
(b)	Get exposed to a relevant subject	Yes
(c)	Curiosity	Yes
(d)	Better Employment Opportunity	Yes
(e)	Complete Course requirements	Yes
(f)	To Improve CGPA	Yes

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			✓		

A: Excellent		B: Very Good		C: Good		D: Satisfactory		E: Poor	

HEAD OF THE DEPARTMENT

COURSE FEEDBACK FORM

Academic Year		2022
Term		Even
Course Number		
Course Title		IBM AI ENGINEERING
Number of Credits		
Type of Course	Regular	Elective	Add-on ✓

I.	Information on the Respondent: (Tick (√) Appropriately)

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	Yes
	(ii)	Has adequate prior exposure to the prerequisites	Yes
	(iii)	Had to pickup relevant additional topics through concurrent study	Yes
	(iv)	Have no exposure to the background material	Yes

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	(a)	Enhance by skill base in the area of specializations	Yes
	(b)	Get exposed to a relevant subject	Yes
	(c)	Curiosity	Yes
	(d)	Better Employment Opportunity	Yes
	(e)	Complete Course requirements	Yes
	(f)	To Improve CGPA	Yes

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				✓	

A: Excellent		B: Very Good		C: Good		D: Satisfactory		E: Poor	

HEAD OF THE DEPARTMENT