A THE THE OF TECHNOLOGY		National Institute of Technology Meghalaya  An Institute of National Importance													CURRICULUM		
Progi	ramm	e Ma	ster of Con	nputer App	olications						Acade	mic Year	of Regula	tion	202	24-25	
Depa	ırtmeı	ent Computer Science and Engineering Semester													IV		
Course		Course Name Pre-Requisit								Credit Structure			Marks D	Marks Distribution			
Code		Artificial Intelligence							L	Т	Р	С	INT	MID	END	Total	
CA50	8								3	0	0	3	50	50	100	200	
Course Objectives		This course familiarizes the basic principles, techniques and applications of Artificial Intelligence (AI).								CO's CA508.1	selection for applications of AI.			Analyze	s Taxonomy		
		This course explains the basic principles to solve problems using Artificial Intelligence.  CA508.2 Able to appraise AI techniques basis strengths and limitations and deci applicability to human-centered p											ns and decid centered pr	de their oblems.	their Appraise llems.		
		This course introduces logic based AI technique, planning algorithms, probability based AI technique and some machine learning models for problem solving.							Course Outcomes	CA508.3	problems w. r. t. different a techniques to solve those p		ent algorithmes entalgent	ms of Al s.	Develop		
										CA508.4	algorithms and planning algorithms.  Able to solve problems using probabi algorithms.			S.	Solve Solve		
										CA508.6					ed Solve		
00-						Mapping	g with F	Program Out	tcomes (POs	5)	Mapping with				pping with	PSOs	
COs	5	PO1	PO2	PO3	PO4	PO5	РО	6 PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CA508		3	2	1	1	1							1	1	1	1	
CA508		3	2	1	1	1							1	1	1	1	
CA508		3	3	3	3	2				1	1	1		3	2		
CA508		3	3	3	3	2				1	1	1		3	2		
CA508		3	3	3	3	2				1	1	1		3	2		
CA50	8	3.00	2.67	2.33	2.33	1.67				1.00	1.00	1.00	1.00	2.33	1.67	1.00	
		3.00	2.07	2.33	2.33	1.07		SY	_ ′LLABUS	1.00	1.00	1.00	1.00	2.33	1.07	1.00	
No.							C	Content						Hours		COs	
I	Overview; Types of Al; Turing test; Intelligent agents; Knowledge representation; Al technique Solving Problems by Searching: AND/OR Graphs; Uninformed search - Depth First Search, Breadth First Search, DFID; Heuristic search - Generate and Test, Hill Climbing, stochastic heuristic search:- Simulated Annealing, Best First Search, Beam Search, A*, Problem reduction search, AO*  Constraint satisfaction problems - constraint satisfaction search; Means-ends analysis Stochastic search methods - Particle Swarm Optimization  Game Playing - Minimax algorithm, Alpha-beta pruning								20	CO1, CO2, CO3							
II	Building a knowledge base: Propositional logic, first order predicate logic (FOPL); Inference in first order predicate logic; Resolution - refutation proofs strategies in FOPL; Theorem Proving in First Order Logic Planning; goal stack planning; partial order planning									06	CO4						
III	Uncertain knowledge and reasoning; Knowledge representation using probabilities; Bayesian Networks								<b>.</b>	05	CO5						
IV	Overview of different forms of learning: unsupervised, supervised, semi-supervised; K-means clustering algorithm; Decision Trees; Naive Bayes' Classifier; Artificial Neural Networks								ustering	08	CO6						
V	Introduction to Expert Systems								03	II.	01, CO2, 03, CO6						

## **Essential Readings**

- 1. S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach," Pearson, 4<sup>th</sup> edition, 2020.
- 2. E. Rich, K. Knight and S. B. Nair, "Artificial Intelligence," McGraw Hill Education, 3<sup>rd</sup> edition, 2017.
- 3. C. Bishop, "Pattern Recognition and Machine Learning," Springer, 1<sup>st</sup> ed. 2006. Corr. 2<sup>nd</sup> printing 2011 edition.

## **Supplementary Readings**

1. D. W. Patterson, "Introduction to artificial intelligence and expert systems," Pearson Education India, 1<sup>st</sup> edition, 2015.

**Total Hours** 

42

- 2. I. Bratko, "Prolog Programming for Artificial Intelligence," Addison Wesley, 4<sup>th</sup> edition, 2011.
- 3. S. O. Haykin, "Neural Networks and Learning Machines," Pearson Education India, 3<sup>rd</sup> edition, 2016.
- 4. D. Jurafsky and J. H. Martin, "Speech and Language Processing," Pearson Education India, 2<sup>nd</sup> edition, 2013.