	SRINIVASA INSTITUTE OF ENGINEERING AND TECHNOLOGY **(UGC – Autonomous Institution)** (Approved by AICTE, Permanently affiliated to JNTUK, Kakinada, ISO 9001: 2015 certified Institution) (Accredited by NAAC with 'A' Grade; Recognised by UGC under sections 2(f) & 12(B)) NH-216, Amalapuram-Kakinada Highway, Cheyyeru (V), AMALAPURAM -533216.	**AIML**	A.Y: 2024-25
		YEAR: III	SEMESTER: II

COURSE SCHEDULE – AT A GLANCE

Name of the Faculty   : K VIJAY BABU

Name of the Course   : AI&ML

Course Code   : :21P61602

Branch   : MECH

The Schedule for the whole Course is: 23/12/2024 To 26/04/2025

Unit	Description	Duration (Date)		Total No. of Periods
		From	To	
1	**Interduction:** Definition of Artificial Intelligence, Evolution, Need, and applications in real world. Intelligent Agents, Agents and environments; Good Behavior -The concept of rationality the nature of environments, structure of agents. Neural Networks and Genetic Algorithms; Neural network representation, problems perceptrons, multilayer networks and back propagation algorithms, Genetic algorithms	23/12/2024	18/01/2025	15
2	Knowledge-Representation and Reasoning: Logical Agents: Knowledge based agents, the Wumpus world, logic. Patterns in propositional Logic, inference in Fist-Order Logic propositional vs fist order inference unification and lifting.	20/01/2025	10/02/2025	15
3	**Bayesian and computational learning:** Bayes theorem concept learning, maximum likelihood, minimum description length principle, Gibbs Algorithm. Naive Bayes Classifier, Instance Based Learning- K-Nearest neighbour learning Introduction to Machine Learning (ML) : Definition, Evolution, Need applications of ML in industry and real world, classification; differences between supervised and unsupervised learning paradigms.	11/02/2025	06/03/2025	13
4	**Basic Methods in Supervised Learning:** Distance -based methods, Nearest- Neighbors, Decision Trees, Support Vector Machines, Nonlinearity and Kernel Methods. Unsupervised Learning: Clustering, K-means, Dimensionality Reduction. PCA and kernel	10/03/2025	29/04/2025	15
5	**Machine Learning Algorithm Analytics:** Evaluating Machine Learning algorithms, Model, Selection, Ensemble Methods (Boosting, Bagging, and Random Forest). Modeling Sequence/Time-Series Data and Deep Learning: deep generative models, Deep Boltzmann Machines, Deep auto-encoders, Applications of Deep Networks.	01/04/2025	26/04/2025	16

Total No. of Instructional periods available for the course: 74

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LESSON PLAN

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COURSE: AI&ML

Unit No.	Topic	Plan		Actual		Teaching Methodology	Signature of the faculty
		No of hours	Date	No of hours	Date		
UINIT-1	Introduction to Artificial Intelligence (AI)	1	23/12/24			Chalk &Talk /PPT	
	Definition of Artificial Intelligence	1	24/12/24			Chalk &Talk /PPT	
	Evolution of Artificial Intelligence	1	26/12/24			Chalk &Talk /PPT	
	The Need for Artificial Intelligence	1	28/12/24			Chalk &Talk /PPT	
	Applications of Artificial Intelligence in the Real World	1	30/12/24			Chalk &Talk /PPT	
	Introduction to Intelligent Agents	1	31/12/24			Chalk &Talk /PPT	
	Agents and Environments	1	02/01/25			Chalk &Talk /PPT	
	Good Behavior in AI	1	03/01/25			Chalk &Talk /PPT	
	The Concept of Rationality in AI	1	04/01/25			Chalk &Talk /PPT	
	Nature of Environments in AI	1	06/01/25			Chalk &Talk /PPT	
	Structure of Agents in AI	1	07/01/25			Chalk &Talk /PPT	
	Introduction to Neural Network	1	08/01/25			Chalk &Talk /PPT	
	Neural Network Representation	1	09/01/25			Chalk &Talk /PPT	
	Perceptrons, Multilayer Networks, and Backpropagation Algorithms	1	16/01/25			Chalk &Talk /PPT	
	Introduction to Genetic Algorithms	1	18/01/25			Chalk &Talk /PPT	
	Introduction to Knowledge Representation and Reasoning	1	20/01/25			Chalk &Talk /PPT	

	Logical Agents	1	21/01/25			Chalk &Talk /PPT	
	Knowledge-Based Agents	1	22/01/25			Chalk &Talk /PPT	
	The Wumpus World	1	23/01/25			Chalk &Talk /PPT	
	Logic in AI	1	25/01/25			Chalk &Talk /PPT	
	Propositional Logic Overview	1	27/01/25			Chalk &Talk /PPT	
	Patterns in Propositional Logic	1	28/01/25			Chalk &Talk /PPT	
	Inference in Propositional Logic	1	29/01/25			Chalk &Talk /PPT	
UNIT-2	First-Order Logic (FOL) Overview	1	30/01/25			Chalk &Talk /PPT	
	Propositional Logic vs. First-Order Logic	1	01/02/25			Chalk &Talk /PPT	
	Inference in First-Order Logic (FOL)	1	03/02/25			Chalk &Talk /PPT	
	Unification in Logic	1	04/02/25			Chalk &Talk /PPT	
	Lifting in Logic	1	05/02/25			Chalk &Talk /PPT	
	The Role of Knowledge Representation in AI Reasoning	1	06/02/25			Chalk &Talk /PPT	
	Combining Knowledge Representation and Reasoning	1	10/02/25			Chalk &Talk /PPT	
	Bayesian and Computational Learning Overview	1	11/02/25			Chalk &Talk /PPT	
	Bayes Theorem in Concept Learning	1	12/02/25			Chalk &Talk /PPT	
UNIT-3	Maximum Likelihood Estimation (MLE)	1	13/02/25			Chalk &Talk /PPT	
	Minimum Description Length Principle	1	15/02/25			Chalk &Talk /PPT	
	Gibbs Algorithm	1	17/02/25			Chalk &Talk /PPT	
	Naive Bayes Classifier	1	18/02/25			Chalk &Talk /PPT	

	Instance-Based Learning (IBL)	1	19/02/25			Chalk &Talk /PPT	
	K-Nearest Neighbor Learning (K-NN)	1	20/02/25			Chalk &Talk /PPT	
	Introduction to Machine Learning (ML)	1	22/02/25			Chalk &Talk /PPT	
	Evolution of Machine Learning	1	03/03/25			Chalk &Talk /PPT	
	Need for Machine Learning	1	04/03/25			Chalk &Talk /PPT	
	Applications of ML in Industry and the Real World	1	05/03/25			Chalk &Talk /PPT	
	Supervised vs. Unsupervised Learning Paradigms	1	06/03/25			Chalk &Talk /PPT	
UNIT-4	Introduction to Supervised Learning	1	07/03/25			Chalk &Talk /PPT	
	Distance-Based Methods in Supervised Learning	1	10/03/25			Chalk &Talk /PPT	
	K-Nearest Neighbors (K-NN) Algorithm	1	11/03/25			Chalk &Talk /PPT	
	Decision Trees in Supervised Learning	1	12/03/25			Chalk &Talk /PPT	
	Support Vector Machines (SVM)	1	13/03/25			Chalk &Talk /PPT	
	Nonlinearity in Supervised Learning	1	15/03/25			Chalk &Talk /PPT	
	Kernel Methods in Supervised Learning	1	18/03/25			Chalk &Talk /PPT	
	Introduction to Unsupervised Learning	1	19/03/25			Chalk &Talk /PPT	
	Clustering in Unsupervised Learning	1	20/03/25			Chalk &Talk /PPT	
	K-Means Clustering Algorithm	1	22/03/25			Chalk &Talk /PPT	
	Dimensionality Reduction Techniques	1	24/03/25			Chalk &Talk /PPT	
	Principal Component Analysis (PCA)	1	25/03/25			Chalk &Talk /PPT	

	Kernel PCA for Nonlinear Dimensionality Reduction	1	26/03/25			Chalk &Talk /PPT	
	Comparison between Supervised and Unsupervised Learning	1	27/03/25			Chalk &Talk /PPT	
	Applications of Supervised and Unsupervised Learning	1	01/04/25			Chalk &Talk /PPT	
	Introduction to Machine Learning Algorithm Analytics	1	02/04/25			Chalk &Talk /PPT	
	Evaluating Machine Learning Algorithms	1	03/04/25			Chalk &Talk /PPT	
	Model Selection in Machine Learning	1	07/04/25			Chalk &Talk /PPT	
	Introduction to Ensemble Methods	1	08/04/25			Chalk &Talk /PPT	
	Boosting in Ensemble Methods	1	09/04/25			Chalk &Talk /PPT	
	Bagging in Ensemble Methods	1	10/04/25			Chalk &Talk /PPT	
	Random Forest in Ensemble Methods	1	15/04/25			Chalk &Talk /PPT	
	Modeling Sequence/Time-Series Data:Introduction to Sequence/Time-Series Data	1	16/04/25			Chalk &Talk /PPT	
	Time-Series Forecasting Techniques	1	17/04/25			Chalk &Talk /PPT	
UNIT-5	Recurrent Neural Networks (RNNs) for Time-Series Data	1	19/04/25			Chalk &Talk /PPT	
	Long Short-Term Memory (LSTM) Networks	1	21/04/25			Chalk &Talk /PPT	
	Introduction to Deep Learning	1	22/04/25			Chalk &Talk /PPT	
	Deep Generative Models	1	23/04/25			Chalk &Talk /PPT	
	Deep Boltzmann Machines	1	24/04/25			Chalk &Talk /PPT	
	Deep Autoencoders	1	26/04/25			Chalk &Talk /PPT	

	Applications of Deep Networks	1	25/04/25			Chalk &Talk /PPT	

Text Books:

1. Deep Learning- Ian Goodfellow, Yoshua Bengio and Aaron Courvile, MIT Press, 2016
2. Deep Learning with Python - Francois Chollet, Released December 2017, Publisher(s): Manning Publications,ISBN: 9781617294433
3. Deep Learning Illustrated: A Visual, Interactive Guide to Artificial Intelligence - Jon Krohn, Grant Beyleveld, Aglaé Bassens, Released September 2019, Publisher(s): Addison-Wesley Professional, ISBN: 9780135116821

Reference Books:

1. Deep Learning from Scratch - Seth Weidman, Released September 2019, Publisher(s): O'Reilly Media, Inc.,ISBN: 9781492041412
2. Artificial Neural Networks, Yegnanarayana, B., PHI Learning Pvt. Ltd, 2009.
3. Matrix Computations, Golub, G.,H., and Van Loan,C.,F, JHU Press,2013 4. Neural Networks: A Classroom Approach, Satish Kumar, Tata McGraw-Hill Education, 2004.

Faculty   **HOD**   **Dean-Academics**   **Principal**