



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad -500043

ELECTRONICS AND COMMUNICATION ENGINEERING

TUTORIAL QUESTIONBANK

Course Title	ELEMENTS OF MACHINE LEARNING			
Course Code	AEC801			
Programme	B.Tech			
Semester	VI			
Course Type	Elective			
Regulation	IARE - R16			
Course Structure	Lectures	Tutorials	Practicals	Credits
	-	-	-	-
Course Coordinator	Mr. J Shiva Ramakrishna, Assistant Professor			
Course Faculty	Mr. J Shiva Ramakrishna, Assistant Professor			

OBJECTIVES

The course covers the concepts of machine learning, construction of decision trees, linear discriminants, basic statics, graph models, genetic algorithms principle component analysis and basic clustering techniques This course helps the students in gaining the knowledge about the evolutionary learning, mathematical and engineering problems. This course helps to undertake future courses that assume this course as a background in deep learning and data science.

S. No	Questions	Blooms Taxonomy Level	Course Learning Outcome
UNIT – I			
TYPES OF MACHINE LEARNING			
PART – A (SHORT ANSWER QUESTIONS)			
1	What is machine learning?	Remember	AEC801.1
2	Describe the task involved in robot driving learning problem.	Remember	AEC801.1
3	Describe the performance measure of robot driving learning problem.	Remember	AEC801.1
4	Describe the training experience involved in robot driving learning problem.	Understand	AEC801.1
5	Describe the task involved in a checkers learning problem.	Remember	AEC801.2
6	Describe the performance measure of checkers learning problem.	Understand	AEC801.3
7	Describe the training experience involved in checkers learning problem.	Understand	AEC801.3
8	Write a short note on entropy.	Remember	AEC801.3
9	Discuss about information gain.	Remember	AEC801.3
10	Define hypotheses in learning	Understand	AEC801.3
11	What is version spaces?	Understand	AEC801.3
PART – B (LONG ANSWER QUESTIONS)			
1	Describe the steps in designing learning problem.	Understand	AEC801.1
2	Describe the issues in machine learning	Remember	AEC801.2
3	Write a short note on decision tree.	Remember	AEC801.3
4	Write the expression for information gain.	Understand	AEC801.3
5	Describe inductive bias in decision tree learning.	Understand	AEC801.3
6	Describe restriction biases.	Remember	AEC801.2
7	Describe preference biases.	Understand	AEC801.2
8	State the issues in decision tree learning.	Remember	AEC801.2

9	What is CART system?	Understand	AEC801.2
10	Give a decision trees to represent the $A \cap -B$.	Understand	AEC801.3
11	Describe the relationship between the learned decision tree and version spaces	Remember	AEC801.3
UNIT-II			
LINEAR DISCRIMINANTS			
PART – A (SHORT ANSWER QUESTIONS)			
1	What is perceptron?	Understand	AEC801.4
2	Define linearly separable sets.	Understand	AEC801.4
3	State the primitives represented by a perceptron	Remember	AEC801.4
4	Write a short note on back propagation.	Remember	AEC801.4
5	Define forward propagation.	Understand	AEC801.4
6	Define Gamma	Understand	AEC801.5
7	Write a short note on Margin.	Remember	AEC801.5
8	Define a linear kernel.	Remember	AEC801.5
9	What are tuning parameters in support vector machines?	Understand	AEC801.4
10	What is classification?	Understand	AEC801.4
PART – B (LONG ANSWER QUESTIONS)			
1	Draw a perceptron.	Remember	AEC801.4
2	State the perceptron training rule.	Understand	AEC801.5
3	Draw a sigmoid threshold unit.	Remember	AEC801.4
4	State the importance of back propagation algorithm.	Remember	AEC801.5
5	Describe various remarks in back propagation algorithm.	Understand	AEC801.6
6	Explain in detail about feedforward network.	Remember	AEC801.6
7	Define a kernel.	Remember	AEC801.6
8	Define regularization parameter.	Remember	AEC801.5
9	What is meant by good margin?	Understand	AEC801.6
10	State the importance of kernel trick.	Remember	AEC801.6
UNIT-III			
BASIC STATISTICS			
PART – A (SHORT ANSWER QUESTIONS)			
1	Define Average.	Remember	AEC801.7
2	Write a short note on Variance.	Remember	AEC801.7
3	Define Co-variance.	Analyze	AEC801.7
4	What is classifier?.	Remember	AEC801.8
5	Define a random variable.	Understand	AEC801.8
6	Draw a simple Bayesian network.	Remember	AEC801.7
7	Define conditional probability.	Understand	AEC801.9
8	Describe inference of a model.	Understand	AEC801.7
9	What are factor graphs?	Remember	AEC801.7
10	What are Bayesian networks?	Understand	AEC801.8
PART – B (LONG ANSWER QUESTIONS)			
1	Describe in detail about average and variance with an examples.	Remember	AEC801.7
2	State Bayes theorem with an example if any.	Understand	AEC801.8
3	What are the characteristics of a naïve bayes classifier.	Understand	AEC801.9
4	Define optimal classifier.	Remember	AEC801.7
5	Explain in detail about Bayesian networks.	Remember	AEC801.7
6	What is MAP hypothesis? Explain briefly about MAP hypothesis.	Understand	AEC801.8

7	Write the expression for Markov assumption.	Remember	AEC801.8
8	Draw a simple Markov chain.	Understand	AEC801.9
9	Describe the importance of forward algorithm.	Understand	AEC801.8
10	Describe Hidden Markov Model.	Understand	AEC801.8
UNIT – IV			
EVOLUTIONARY LEARNING			
PART – A (SHORT ANSWER QUESTIONS)			
1	Define fitness function.	Remember	AEC801.10
2	Write a short note on offspring.	Remember	AEC801.10
3	What is meant by truncation selection?	Remember	AEC801.10
4	Describe fitness proportional selection?	Understand	AEC801.11
5	Write a short note on crossover.	Remember	AEC801.11
6	What are the different form of crossover.	Remember	AEC801.12
7	Define Ensemble learning.	Understand	AEC801.12
8	Describe genetic programming.	Understand	AEC801.12
9	What is meant by estimation distribution algorithm?	Remember	AEC801.12
10	What is meant by dimensionality reduction?	Remember	AEC801.12
PART – B (LONG ANSWER QUESTIONS)			
1	Describe the parameters used in Genetic algorithm.	Understand	AEC801.12
2	Write a short note on mutate.	Remember	AEC801.10
3	Write the expression for probability of hypothesis.	Remember	AEC801.12
4	Describe hypothesis representation.	Understand	AEC801.11
5	What are Genetic operators?	Understand	AEC801.11
6	Describe principle component analysis of a data.	Remember	AEC801.10
7	Define common factor analysis.	Remember	AEC801.10
8	What is meant by factor loadings in PCA?	Understand	AEC801.11
9	Define factor score?	Understand	AEC801.12
10	Define bayes theorem for classification.	Remember	AEC801.12
UNIT-V			
CLUSTERING			
PART – A (SHORT ANSWER QUESTIONS)			
1	What is Clustering?	Understand	AEC801.14
2	What are the different types of Clustering.	Remember	AEC801.14
3	Discuss about similarity.	Remember	AEC801.13
4	What are different types of similarity measure.	Understand	AEC801.13
5	Describe outliers in data.	Understand	AEC801.13
6	What are hierarchical methods of clustering?	Understand	AEC801.14
7	Define K-means clustering.	Remember	AEC801.13
8	Describe the purpose of clustering with categorical attributes.	Understand	AEC801.14
9	What are the various strategies for grouping of variables?	Understand	AEC801.13
10	What are ClustOfVar?	Understand	AEC801.13
PART – B (LONG ANSWER QUESTIONS)			
1	Describe similarity and distance measures	Remember	AEC801.14
2	What are K-means and hierarchical clustering techniques?	Understand	AEC801.14
3	What are partitional algorithms?	Remember	AEC801.13
4	State the applications of clustering.	Understand	AEC801.15
5	What are agglomerative algorithms?	Understand	AEC801.13
6	What are divisive algorithms for clustering?	Remember	AEC801.15
7	State the applications of hierarchical clustering?	Understand	AEC801.15
8	What are the drawbacks of outliers in clustering?	Remember	AEC801.15
9	What are the objectives of clustering of variables?	Understand	AEC801.15
10	Describe in detail about Dice's coefficient.	Remember	AEC801.14