MACHINE LEARNING

(Effective from the academic year 2018 -2019)

SEMESTER – VI

Subject Code	18AI61	**CIE Marks**	40
Number of Contact Hours/Week	3:2:0	**SEE Marks**	60
Total Number of Contact Hours	50	**Exam Hours**	3 Hrs

CREDITS – 04

Course Learning Objectives: This course will enable students to:

- Define machine learning and understand the basic theory underlying machine learning.
- Differentiate supervised, unsupervised and reinforcement learning
- Understand the basic concepts of learning and decision trees.
- Understand Bayesian techniques for problems appear in machine learning
- Perform statistical analysis of machine learning techniques.

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Module – 1	10
Introduction: Machine learning Landscape: what is ML?, Why, Types of ML, main challenges of ML (T2:Chapter1) Machine learning Landscape: what is ML?, Why, Types of ML, main challenges of ML (T2:Chapter1) Perspectives and Issues – **Concept learning and Learning Problems** – Designing Learning systems, Perspectives and Issues – Concept Learning – Find S-Version Spaces and Candidate Elimination Algorithm –Remarks on VS- Inductive bias – **T2: Chapter 1** T1:Chapter 1 and 2)	
Module – 2	10
End to end Machine learning Project : Working with real data, Look at the big picture, Get the data, Discover and visualize the data, Prepare the data, select and train the model, Fine tune your model **Classification** : MNIST, training a Binary classifier, performance measure, multiclass classification, error analysis, multi label classification, multi output classification (T2: Chapter 2 and 3)	
Module – 3	10
Training Models: Linear regression, gradient descent, polynomial regression, learning curves, regularized linear models, logistic regression Support Vector Machine: linear, Nonlinear , SVM regression and under the hood **(T2: Chapter 4 and 5)** **RBT: L1, L2**	
Module – 4	10
Decision Trees Training and Visualizing DT, making prediction, estimating class, the CART training, computational complexity, GINI impurity, Entropy, regularization Hyper parameters, Regression, instability **Ensemble learning and Random Forest:** Voting classifiers, Bagging and pasting, Random patches, Random forests, Boosting, stacking **(T2: Chapter 6 and 7)** **RBT: L1, L2**	
Module – 5	10
Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier– example- Bayesian Belief Network – EM Algorithm **Text book (T1: Chapter 6)** **RBT: L1, L2**	

Course outcomes: The students should be able to:

- For any problem selected make sure that the application should have five or more **tables indicative areas include; health care , salary management, office automation, etc.**

Laboratory Outcomes: The student should be able to:

- Create, Update and query on the database.
- Demonstrate the working of different concepts of DBMS
- Implement, analyze and evaluate the project developed for an application.

Conduct of Practical Examination:

- Experiment distribution
  - For laboratories having only one part: Students are allowed to pick one experiment from the lot with equal opportunity.
  - For laboratories having PART A and PART B: Students are allowed to pick one experiment from PART A and one experiment from PART B, with equal opportunity.
- Change of experiment is allowed only once and marks allotted for procedure to be made zero of the changed part only.
- Marks Distribution (Subjected to change in accordance with university regulations)

k) For laboratories having only one part – Procedure + Execution + Viva-Voce: 15+70+15 = 100 Marks

l) For laboratories having PART A and PART B

i. Part A – Procedure + Execution + Viva = 6 + 28 + 6 = 40 Marks

ii. Part B – Procedure + Execution + Viva = 9 + 42 + 9 = 60 Marks

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