मेडी-केप्स विश्वविद्यालय, इंदौर

Medi-Caps University, Indore

Syllabus

Course Code	Course Name	Hours per week			Total	
		L	T	P	Hrs.	Credits
CA5EL52	Machine Learning	4	0	0	4	4

Course Objectives:

A. Understand the fundamentals of Machine Learning Techniques
B. Understand supervised learning techniques, such as regression and classification and intricacies of ML algorithms
C. Become familiar with unsupervised learning techniques, such as clustering and association and understand different dimensionality reduction techniques.
D. Become familiar with neural network
E. Become familiar with ensemble methods

Prerequisites: Nil
Co-requisites: Nil

Curriculum:

UNIT-I-Introduction to Machine Learning

What is Artificial Intelligence, What is Machine Learning, AI vs. ML, Applications of ML, Types of Machine Learning Algorithms, AI vs. ML vs. DL, Data Mining vs. Machine Learning vs. Big Data Analytics, Essential Mathand Statisticsfor ML.

UNIT-II- Supervised Learning

Introduction to Supervised Learning,Linear Regression: Cost function, Gradient descent, learning rate; Classification: Logistic Regression, Nearest-Neighbors,Naive Bayes classifier.Overfitting and Underfitting, feature scaling, Regularization, Bias and Variance, Decision Trees, Introduction to Support Vector Machines, Applications.

UNIT-III-Unsupervised Learning

Clustering: K-means, hierarchical, Association analysis: Apriori algorithm, Dimensionality Reduction: Subset Selection, Principal Components Analysis,LinearDiscriminant Analysis,Introduction to Reinforcement learning, Applications.

UNIT-IV- Ensemble Methods

Evaluating Machine Learning algorithms and Model Selection, Ensemble Methods: Mixture Models, Classifier using multiple samples of the data set, improving classifier by focusing on error, weak learner with a decision stump, Bagging, Stacking, Boosting, Implementing the AdaBoost algorithm, Classifying with AdaBoost Bootstrapping and cross validation.

UNIT-V-Introduction to Deep Learning
Introduction to Neural Network, Perceptron, Feed forward, Back Propagation, Back propagation with simple example Convolution Neural Network and its types.

.

Case Studies:
Not Applicable

List of Practical:
Not Applicable

Course Outcomes:

After completion of the course, the student will be able to:

CO1. Student will be able to understand the concept of Machine learning and range of problems that can be solved by machine learning.
CO2. They will be able to compare different types of learning algorithms and their applications.
CO3. Interpret machine learning problems.
CO4. Apply Machine learning techniques for problem solving.
CO5. Identify methods to improve machine learning results for betterpredictive performance.

Text Books:

1. Machine Learning, Tom Mitchell, McGraw Hill.
2. Aurelien Geon, "Hands-On Machine Learning with Scikit-Learn and Tensorflow:Concepts, Tools, and Techniques to Build Intelligent Systems", Shroff/O'Reilly
3. Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning, Springer (freely available online)
4. Kevin Murphy, Machine Learning: A Probabilistic Perspective, MIT Press.

Reference Books:

1. Christopher Bishop, Pattern Recognition and Machine Learning, Springer.
2. Hal Daumé III, A Course in Machine Learning (freely available online)
3. Python Machine Learning: Machine Learning and Deep Learning with Python, scikit-learn, and TensorFlow, Packt Publishing.

Web Source:

1. https://www.coursera.org/learn/machine-learning
2. https://www.kdnuggets.com
3. https://towardsdatascience.com
4. https://www.analyticsvidhya.com