

# BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY AND SCIENCE (A) :: BATLAPALEM

## MASTER OF COMPUTER APPLICATIONS (MCA) (For Two-Year PG Programme)

III Semester		L	T	P	C
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<b>MACHINE LEARNING WITH PYTHON (23MC3T10)</b>					

### Course Objectives:

From the course the student will learn

- To design and analyze various machine learning algorithms and techniques with a modern outlook focusing on recent advances.
- Explore supervised and unsupervised learning paradigms of machine learning.
- To explore Deep learning technique and various feature extraction strategies.

**Course Outcomes(CO's):** At the end of the course, student will be able to

- Illustrate and comprehend the basics of Machine Learning with Python
- Demonstrate the algorithms of Supervised Learning and be able to differentiate linear and logistic regressions
- Demonstrate the algorithms of Unsupervised Learning and be able to understand the clustering algorithms
- Evaluate the concepts of binning, pipeline Interfaces with examples
- Apply the sentiment analysis for various case studies

### UNIT I:

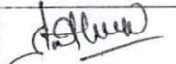
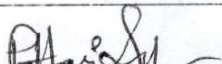

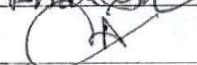

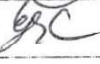

**Introduction to Machine Learning with Python:** Introduction to Machine Learning, basic terminology, Types of Machine Learning and Applications, Using Python for Machine Learning: Installing Python and packages from the Python Package Index, Introduction to NumPy, SciPy, matplotlib and scikit-learn, Tiny application of Machine Learning.

### UNIT II:

**Supervised Learning:** Types of Supervised Learning, Supervised Machine Learning Algorithms: k-Nearest Neighbors, Regression Models, Naive Bayes Classifiers, Decision Trees, Ensembles of Decision Trees, Kernelized Support Vector Machines, Uncertainty Estimates from Classifiers.

### UNIT III:

**Building good training datasets:** Dealing with missing data, Handling categorical data, partitioning a

University Nominee: Dr. Suneetha Eluri		Alumni Member Mr. Harisuresh Poliseti	
Subject Expert:1 Dr. B Kezia Rani,		Chairman : Mr. AVS M Ganesh	
Subject Expert: 2 Dr. Suneel Kumar Duvvuri		Member: Mr. G L N V S Kumar	
Representative from Industry, Mr. Narina Saikrishna			

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data set into separate training and test datasets, bringing features onto the same scale, selecting meaningful features, assessing feature importance with random forests. **Compressing data via dimensionality reduction:** Unsupervised dimensionality reduction via PCA, Supervised data compression via linear discriminant analysis (Text Book 2)

### UNIT IV:

**Learning best Practices for Model Evaluation and Hyperparameter tuning:** streamlining workflows with pipelines, using k-fold cross validation to assess model performance, debugging algorithms with learning and validation curves, fine tuning machine learning models via grid search, looking at different performance evaluation metrics. **Combining different model sfor Ensemble learning:** learning with ensembles, combining classifiers via majority vote, bagging-building an ensemble of classifiers from bootstrap samples, leveraging weak learners via adaptive boosting (Text Book 2)

### UNIT V:

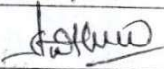

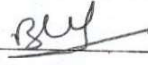
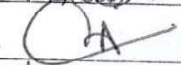

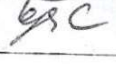
**Working with Text Data (Data Visualization):** Types of Data Represented as Strings, Example Application: Sentiment Analysis of Movie Reviews, Representing Text Data as a Bag of Words, Stop Words, Rescaling the Data with tf-idf, Investigating Model Coefficients, Approaching a Machine Learning Problem, Testing Production Systems, Ranking, Recommender Systems and Other kinds of Learning.

### Text Books:

- 1) Introduction to Machine Learning with Python: A Guide for Data Scientists, Andreas C. Muller & Sarah Guido, Orielly Publications, 2019.
- 2) Python Machine Learning, Sebastian Raschka & Vahid Mirjalili, 3rd Edition, 2019.
- 3) Machine Learning using Python, Manaranjan Pradhan, U Dinesh Kumar, Wiley, 1<sup>st</sup> Edition, 2019

### Reference Books:

- 1) Machine Learning, Tom M. Mitchell, Mc Graw-Hill Publication, 2017
- 2) Building Machine Learning Systems with Python, Luis Pedro Coelho, Willi Richert, 2nd Edition, 2015.
- 3) Programming and Problem Solving with Python, Ashok Namdev Kamthane. Amit Ashok Kamthane, TMH, 2019.

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