

Subject Code: 1RI3000102	Subject Title: Essentials of Disciplinary Research Subject-1 Python Programming for Machine Learning
Pre-requisite Subject	

Objectives of course: The data collected by organization needs insights to take the decisions, for predictions as well as for finding hidden patterns inside the data. Python is an appropriate language supporting all the features and libraries to perform data science activities. This subject covers the overview of the python with emphasis on various python data structures and various libraries like Pandas, NumPy, Matplotlib for performing various data science function including data preparation, cleaning, exploratory analysis and visualization

Learning outcomes:

Upon successful completion of this course the student would be able to:

- Develop proficiency in creating based applications using the Python Programming Language.
- Do testing and debugging of code written in Python
- Apply various Python data structures to effectively manage various types of data.
- Design applications applying various operations for data cleansing and transformation.
- Use various data visualization tools for effective interpretations and insights of data.

Teaching Scheme (Credit Distribution)				Evaluation Scheme(% Marks)	Total Marks
Lecture	Tutorial	Practical	Credit	Continuous (Internal) Assessment	100
3	1	--	4	100%	

Unit	Content	Lecture	Wt. (%)
1	Introduction to Python: Basic Operations in Python, Data types in Python	6	20%
2	Data Handling in Python (Using Pandas Library), Working with Data Frame (Using Pandas Library), Summarize data	9	30%
3	Numpy Library, Data Visualization (Using Matplotlib Library)	9	30%
4	Descriptive Statistics, Sci-kit learn Library	6	20%

List of References:

1. John V Guttag. "Introduction to Computation and Programming Using Python", Prentice Hall of India
2. R. Nageswara Rao, "Core Python Programming", dreamtech
3. Wesley J. Chun. "Core Python Programming - Second Edition", Prentice Hall
4. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, "Data Structures and Algorithms in Python", Wiley
5. Kenneth A. Lambert, "Fundamentals of Python – First Programs", CENGAGE Publication
6. Luke Sneeringer, "Professional Python", Wrox

Subject Code: 1RI3000103	Subject Title: Essentials of Disciplinary Research Subject-2 Fundamentals of Machine Learning
Pre-requisite Subject	- NONE -

Objectives of course: This course provides great insight in the field of AI and Machine Learning and its techniques are being used in many areas which directly affect human life. Advanced concepts in the fields of AI such as Machine Learning, Deep Learning, and Natural Language Processing are introduced.

Learning outcomes:

Upon successful completion of this course the student would be able to:

- Explore the fundamental issues and challenges in Machine Learning including data and model selection and complexity
- Evaluate the various Supervised and Unsupervised Learning algorithms using appropriate Dataset
- Design and implement various machine learning algorithms in a range of real-world applications

Teaching Scheme (Credit Distribution)				Evaluation Scheme(% Marks)	Total Marks
Lecture	Tutorial	Practical	Credit	Continuous (Internal) Assessment	50
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Unit	Content	Wt. (%)
1	Introduction to Machine Learning, Types of Machine Learning	10%
2	Data Pre-processing, Regression Algorithm	15%
3	Classification Techniques: Logistic Regression, K-NN, SVM, Naïve Bayes, Decision Tree Classification, Random Forest Classification	35%
4	Classification Techniques: K-Means Clustering, Hierarchical Clustering	20%
5	Deep Learning, Neural Networks	20%

List of References:

1. Machine Learning, Saikat Dull, S. Chjandramouli, Das, Pearson
2. Pattern Recognition and Machine Learning, by Christopher Bishop
3. Machine Learning with Python for Everyone, Mark E. Fenner, Pearson
4. Deep Learning: Methods and Applications, Li Deng and Dong Yu
5. Neural Networks and Deep Learning, Michael Nielsen