Py Course Syllabus

- Introduction to Business Analytics
  - What is Business Analytics is and how these techniques represent an opportunity.
  - Understanding data and data distribution that exists in the world makes learning about statistics critically important
  - Understanding statistics is a way of thinking that can help you make better decisions
  - How the DCOVA framework for applying statistics can help you solve business problems
- Basic Understanding of Data & Data Distribution
  - Different type of Data & Data Sources
  - Scale of Measurement
  - Kind of analysis to apply
  - Checking data distribution and different measurement
- Introduction to Python and Elementary Programming
  - Introduction to Python and Programming concept
  - Understanding of Business Application, Automation and development of Application Using Python
  - Download and Install python
  - Download and Install Anaconda(IDE)
  - Exploring Jupyter & spyder IDE to write and run python code.
  - Writing Simple programme Using Python
  - Reading Input from Console Identifiers
  - Variables , Assignment Statement , and Expressions
  - Simultaneous Assignment and Named Constants
  - Numeric Data Types and Operators
  - Type Conversion and Rounding, Boolean Operation
- Python Programming (Working with Functions, Strings, and Objects)
  - Common Python Functions, Working with Built in Function
  - Composition of Functions
  - User Defined Function
  - Function call
  - Writing Python Script
  - Introduction to Objects and Methods
  - Formatting Numbers and Strings
- Python Programming (Working with Strings and Lists)
  - Working with string and List
  - Data Manipulation with string and Lists
  - Multidimensional List
- Python Programming (Working with Tuples and Dictionaries)
  - Working with Tuples and Dictionaries
  - Data Manipulation with Tuples and Dictionaries
  - Scripting with Tuples and Dictionaries
- Python Programming (Getting Started with Raw Data)
  - The world of arrays with NumPy
  - Empowering data analysis with pandas
  - The data structure of pandas ,Series ,Data Frame ,Panel
  - Inserting and exporting data :CSV ,XLS ,JSON , Database
  - Data cleansing: Checking the missing data , Filling the missing data ,String operations ,Merging data , Data operations : Aggregation operations , Joins : The inner join, The left outer join ,The full outer join ,The group by function
- Python Programming(Data Wrangling & Aggregation)
  - Merging Data, Grouping Data
  - Concatenating Data
  - Applying Aggregations on Data frame
  - Apply Aggregation on Single and Multiple Columns of a DataFrame
- Python Programming (Selections)
  - Introduction
  - Boolean Types, Values, and Expression
  - Generating Random Numbers
  - If Statements
  - Case Study
  - Nested if-Else Statement
  - Conditional expression
  - Case Study
- Python Programming (Loops)
  - Introduction
  - The While Loop
  - The for Loop
  - Nested Loops
  - Case Study
- Python Programming (Function)
  - Defining Functions
  - Calling Functions
  - Working with different type of functions
  - Recursive Function
  - Anonymous function / Lambdas
  - Function Decorators
  - Generators
  - Creating own module in python
  - Case Study: Creating Reusable Functions
- Project On Python Programming:Application
  - PROJECT: Business Oriented case study
- (Making Sense of Data through Advanced Visualization with Python(matplotlib , pyplot library)
  - Using keyword arguments , Using the setter methods Using the setp() command, Creating multiple plots , Playing with text , Styling your plots , Box plots , Heatmaps , Scatter plots with histograms , A scatter plot matrix , Area plots, Bubble charts, Hexagon bin plots, Trellis plots, A 3D plot of a surface
- Working with Pandas, NumPy
  - Working with Pandas:
    - Python Pandas – Introduction
    - Python Pandas - Environment Setup
    - Introduction to Data Structures in Pandas
    - Python Pandas - Basic Functionality
    - Python Pandas - Descriptive Statistics
    - Python Pandas - Function Application
  - Working with NumPy
    - Creating an Array, Reading Text Files
    - Array Indexing, N-Dimensional Arrays
    - Data Types,Array Math, Array Methods
    - Array Comparison and Filtering
    - Reshaping and Combining Arrays
    - Understanding Data & Basic data Analysis Concepts
- Basic of Data Analysis & Creating Reports (NumPy, SciPy)
  - Data Distribution and Exploring Data , Missing Data
  - Creating Reports
  - Basic understanding of the Analytics Techniques using Python
  - A normal distribution ,binomial distribution , Poisson distribution ,A z-score , A p-value , One-tailed and two-tailed tests ,Type 1 and Type 2 errors , A confidence interval ,Correlation , Z-test vs T-test ,The F distribution , The chi-square distribution
- Machine Learning Algorithm (With Python)
  - Different types of machine learning
  - Supervised learning , Unsupervised learning, Reinforcement learning , Decision trees ,Linear regression, Logistic regression ,The naive Bayes classifier, The k-means clustering , Hierarchical clustering etc.
- Performing Predictive Modeling with a Linear & Multiple Regression Analysis
  - Introduction- Applications
  - Assumptions of Linear Regression
  - Building Linear Regression Model, Understanding standard metrics (Variable significance, Rsquare/Adjusted R-square, Global hypothesis, etc), Assess the overall effectiveness of the model, Validation of Models {Re running Vs. Scoring), Standard Business Outputs Interpretation of Results- Business Validation, Implementation on new data
- Forecastingwith Time Series Analysis
  - The data set: Open Power Systems Data
  - Time series data structures
  - Time-based indexing
  - Visualizing time series data
  - Seasonality
  - Frequencies
  - Resampling
  - Rolling windows
  - Trends
- Project on Statistical Analysis & Predictive Modelling using Python
  - Marketing Predictive Analysis
  - Financial Data Analysis
  - HR Analytics
- Classification Technique: Estimating the Likelihood of Events (Logistics Regression)
  - Logistic regression :Data preparation ,Creating training and testing sets ,Building a model ,Model evaluation , Evaluating a model based on test data , Model building and evaluation with SciKit
  - Linear Regression Vs. Logistic Regression Vs. Generalized Linear Models, Building Logistic Regression Model (Binary Logistic Model), Understanding standard model metrics, Validation of Logistic Regression Models (Re running Vs. Scoring),Standard Business Outputs, Interpretation of Results- Business Validation, Implementation on new data
- Decision Trees & Random Forest (Ensemble Modelling techniques)
  - Apply decision tree in classification
  - Creating Random forest to apply ensemble modelling technique
- Applying Segmentation with k-means Clustering
  - Determining the ideal number of clusters through the k-means technique
  - Clustering with the k-means algorithm
- Concluding Session
  - Recap & Doubt Clearing Session
  - Evaluation
- FINAL PROJECT (COMPULSORY) (Any two)
  - Credit Risk Analysis
  - Fraud detection Analysis
  - Network Intrusion Analysis
  - Customer Behavior Analysis
  - RFM Marketing Analytics
  - Market Basket Analysis
  - Financial Data Analysis
  - HR Analytics
  - Stock Market Analysis
  - Twitter Text Analytics & Mining