Data Science Lectureflow

The below given flow should be followed by each faculty while taking lectures. If the faculty decides to change the flow - he/she will need to first take permission from the Training coordinator at the HO (Ahmedabad office)

Module 1) DA - Introduction to Python	14

- Why Python?, Features of Python Programming, Style Installation, Print Function, Comments
- Variable and data types
- Operators in python
- Arithmetic, Assignment, Logical, Comparison, Identity , Membership
- collections
- List, Tuple, Set, Dictionary
- Conditional Statements
- If, If-else, If-elif-else, Nested If-else
- Looping Statements
- for loop, while Loop, Nested loops, Range Function
- Control Statements
- break , Continue, pass
- Functions
- Definition, Types of Function, Defining a Function, Calling a Function, Function Arguments, Lambda function
- Scope Of Variables
- Global, Local
- Modules
- Introduction, How to import?, Math module, Random Module, Packages
- Input - Output
- Reading Input from Keyboard, Printing Output
- Files and Exceptions Handling
- File Operations: Opening and Closing, Read and Writing , Exceptions: try except finally
- OOPS Concepts
- Class, Objects, Inheritance, Polymorphism, Overloading

Module 1) Introduction to Statistics (April 2023)	10

- Random Variable
- Types of Random Variables
- Discrete Random Variable
- Continuous Random Variable
- Mean of Random Variable
- Variance of Random Variable
- Continuous Distribution
- Uniform Distribution
- Normal Distribution
- Standard Normal Distribution
- Exponential Distribution
- Gamma Function
- Chi square Distribution
- t Distribution, F Distribution
- Discrete Distributions, Uniform Distribution, Bernoulli Distribution, Geometric Distribution, Poisson Distribution
- Confidence Intervals, Sampling and Statistical Inference
- Point Estimation
- Hypothesis Testing
- Joint Distributions

Module 2) Introduction to Excel (April 2023)	14

- Excel introduction
- VLOOKUP Function and Its Uses
- HLOOKUP Function and Its Uses
- MID Function and Its Uses
- OFFSET Function with Examples
- CHOOSE Function and Its Uses
- Handle Wrapped Text in Excel
- Clear Formatting
- Removing Duplicates
- using Find and Replace
- Working and creating Pivot Tables
- Dynamic Array Functions
- INDEX, MATCH, SUMPRODUCT, SUMIFS, and COUNTIFS
- Introduction to power query
- Installing Power Query Add-in in Excel
- Overview of the Query Editor
- Import Data from Web
- Import Data from Text Files
- Import Data from CSV Files
- Import Data from an External Excel Workbook
- Import Data from Current Excel Workbook
- Append Excel Tables in the Same Workbook , Merge Different Tables or Queries Append Tables from Different Workbooks into One Table, Combine Excel Files from a folder ,Combine CSV files from a Folder ,Get a List of File Names from a Folder
- Overview of PQ Functions, Useful Text Functions , Creating IF OR and IF AND functions
- Overview of M Language , Inserting Comments in M Code, Convert Query to Function Extract Data from a Table based on Selection Refreshing Queries , Get Files Names from Folder Based on Selection
- Building Excel Dashboards

Module 3) Applied Statistics in Excel (April 2023)	5

• Calculate Frequency Distribution in Excel • Correlation Matrix Using Excel • Descriptive Statistics Using Excel • Normal Distribution Using Excel • Sample Size Calculator with Excel • Compute Correlation Matrix • Compute partial correlation matrix	
Module 4) Working with Database using SQL (April 2023)	**10**
• What is SQL, Why to Use SQL, SQL Syntax • SQL Basic Data Types - Working With String, Numeric, Date and Time • SQl Operator and Type of Operator • Working with Arithmetic, Multiplication, Division and Modulus • SQL Logical Operator • SQL Set Operators • SELECT statement, SELECT Statement with WHERE clause, SQL SELECT Statement with GROUP BY clause, SQL SELECT Statement with HAVING clause • SQL SELECT DISTINCT, Select Count Function in SQL • SQL Count Function With DISTINCT keyword • LIMIT Clause in MySQL • SQL SELECT LAST • SQL SELECT RANDOM • SQL SELECT AS • SQL SELECT from Multiple Tables • SQL SELECT DATE • SQL SELECT SUM • SQL SELECT NULL • SQL AND and SQL OR • SQL ORDER BY Clause • SQL JOIN • SQL OUTER JOIN • SQL LEFT JOIN • SQL FULL JOIN	
Module 9) Creating Dashboard with Visualization Tool (april 2023)	**15**

- Introduction to tableau and Download tableau Public Desktop
- Connecting with different Data Types
- tableau vs Excel Tableau Live Vs Extract
- Tableau Data Types Tableau View Data
- Tableau Column Formatting Sorting In tableau
- Drill Down And Hirearchies Grouping in Tableau
- Measure Name and Values Discrete Vs Continous Parameters
- Tableau Combine Tableau Sets
- Giving Title and Caption Tableau Granularity
- Worksheet Interface Managing Metadata
- Cross Database Join Tableau Data Blending Data Blending Calculations
- Using Filter in tableau Advance Interactive Filter
- Data Source Filter Using Size, Color, Label, Tooltips, Shapes
- Tableau Calculation, Number Function, String Function Conditional Formatting, Rank and Logical Functions
- Introduction to Chart, Scatter Chart, Word maps, Line Chart, Bubble Chart
- Bar chart, and Stacked Chart, Tree Maps, Bump Chart
- Funnel Chart, WaterFall , Pie Chart
- Introduction to Maps, Map Options, Map Layers, Custom Territories, Custom Geocoding
- Example: Vehicle Registration State Wise Example: Number of National Park Tableau Dashboard introduction, Dashboard Format
- Tableau Creating Story
- Introduction To Power BI , What is Power Bi , Why is Power BI and Power BI Installation and set up
- Power BI Installation and set up , Understanding Power BI Dashboard
- Components Of Power BI
- Power Query (ETL tool) Overview of the Query Editor , Overview of PQ Functions,
- Power Pivot Table
- Power View (Visualization Charts)
- Power BI Services
- Power BI Report View ,Model View , Power BI Table View
- How to make Relations in Two or more tables in Power BI
- Power BI Basic Power Charts (1-Column Chart 2-Stacked Chart 3-Pie Chart 4-Funnel Chart 5-Ribbon Chart
- Types of Data connection power BI
- Format Tools in Power BI for Charts and Visualization
- Create Tables in Power BI
- Data Analysis Expressions DAX Baisc 3 to 4 Examples
- Useful Text Functions
- Creating IF OR and IF AND functions
- Overview of M Language
- How to Change Background in Power BI Map
- How to Create a Map in Power BI
- Subtotal & Total in Matrix
- Cards & Filters in Power BI
- Slicers in Power BI
- Creating Dashboard with POWER BI
- Power BI Dashboard 2

Module 4) Analytics with Python - April 2023	6

- working with math modules
- Documenting functions using Docstrings
- Exercise - Data Analysis for Vacation Planning
- Interacting with OS module
- Reading from a file
- Closing files automatically using with
- Reading a file line by line
- Processing data from files
- Writing to files

Module 5) - Working with Numpy - April 2023	3

- What is AI , Ml And Dl and Difference Between them,Project life Cycle of ML Project,Math Refresher, basic statistics
- creating 1D array and ND array
- Working with numpy functions
- numpy array attributes
- reshaping and ravel function
- Arithmetic operations on array
- Boradcasting and upcasting
- Conditional Operators in array
- array indexing and slicing, boolean indexing

Module 6) - Working with Pandas April 2023	6

- Handle the Missing And Categorical data,Outliers,Feature Engineering,Model Selection
- working on Series objects
- indexing on Series
- Creating DataFrame
- Multiindexing in dataframe
- Droping level , transposing
- Accessing rows, Adding and removing columns
- Querying and Sorting DataFrame
- Operations on DataFrame
- Automatic alignment

Module 7) -Ploting data with Matplotlib and Seaborn - April 2023	2

- Creating and customizing line charts using Matplotlib
- Visualizing relationships between two or more variables using scatter plots
- Studying distributions of variables using histograms & bar charts
- Visualizing two-dimensional data using heatmaps

Module 8) - Supervised Machine Learning - April 2023	10

- Logistic Regression,K-Nearest Neighbors,SVM And Kernel SVM,Naive Bays
- Decision Tree Classifier,Evaluation Of Classification Model,Small Dataset Assignment
- Introduction to Machine Learning and Problem Domain
- Decision Tree
- Machine Learning Fundamental
- kNNs-SVM-RBF
- Preprocessing Pipeline
- column-transformer
- Linear Models
- Classification metrics
- regression metrics
- K-means Algorithms

Module 9) Unsupervized Machine Learning	**4**
• K-means Algorithms • DBSCAN and Hierarchical Clustering • Recommender Systems	
Module 10 (Applying Machine Learning in NLP and CV - April 2023	**8**
• Introduction to natural language processing • Introduction to computer vision • Time series • Deployment of Machine Learning Model in Real World	
Module 11) Neural Network and Deep Learning - April 2023	**19**
• Tensorflow Fundamentals • Introduction to Deep Learning • Neural Network for Regression in TensorFlow • Neural Network for Classification in TensorFlow • Deep Sequence Modeling • Generating Music using Sequence Modeling with Tensorflow • SkimLit NLP Project using Tensorflow • Deep Computer Vision • Convolution Neural Network in TensorFlow • Transfer Learning in Tensorflow for Feature Extraction and Fine Tuning • Deep Generative Modeling • Designing a Facial Detection System	