Module - 1

Session- 1	Session - 2
Why python ? Python IDE Hello World Program Variables & Names String Basics List Tuple Dictionaries	Conditional Statements For and While Loop Functions Numbers and Math Functions Common Errors in Python

Module - 2

Session- 3	Session - 4
Functions as Arguments List Comprehension File Handling Debugging in Python Class and Objects Lambda, Filters and Map	Functions as Arguments List Comprehension File Handling Debugging in Python Class and Objects Lambda, Filters and Map

Module - 3

Session- 5	Session - 6
Introduction to algorithmic Thinking Algorithm Efficiency and time complexity Example algorithms - binary search, Euclid's algorithm Data structures - stack, heap, and binary trees	Memory Management/Technologies Best Practices – Keeping it simple, dry code, naming Conventions, Comments, and docs. Assessment

Module - 4

Session- 7	Session - 8
Session 1 : Introduction to Pandas Series Data Structure - Querying and Indexing	Session 2 : Group by operation Pivot table Date/Time functionality Example: Manipulating DataFrame

DataFrame Data Structure - Querying, Indexing, and loading Merging data frames	

Module - 5

Session- 9	Session - 10
Data Modeling Normalization, and Star Schema ACID transactions Select, insert, update & delete (DML and DQL) Join operations	Window functions (rank, dense rank, row number etc) Data Types, Variables and Constants Conditional Structures (IF, CASE, GOTO and NULL) Integrating python with SQL

Module - 6

Session- 11	Session - 12
No Schema Install MongoDB How MongoDB Works? Insert First Data	CRUD Operations Insert Many Update and Update Many Delete and Delete Many

Module - 7

Session- 13	Session - 14
Diving Deep into find Difference between update and update many Projection Intro to Embed Documents Embed Documents in Action Adding Arrays Fetching Data From Structured Data Aggregation	Schema Types Types of Data in MongoDB Relationship between data's One to One using Embed Method One to One using ReferenceMany One to Many Embed One to ManyReferenceMethod Assessment - MongoDB

Module - 8

Session- 15	Session - 16
Why counting and probability theory? Basics of sample and event space Axioms of probability	Expectation and its properties Variance and its properties

Total Probability theorem and Bayes Theorem Random variables, PMF and CDF Discrete Distributions - Bernoulli, Binomial and Geometric	Continuous Distributions - uniform, exponential and normal Sampling from continuous distributions Simulation techniques - simulating in NumPy Assessment

Module - 9

Session- 17	Session - 18
Inferential statistics - sample vs population CLT and its proof Chi-squared distribution and its properties Point and Interval Estimators Estimation technique - MLE	Interval Estimator of μ with unknown σ Examples of estimators Hypothesis testing - I Hypothesis testing - II Hypothesis testing - III Assessment

Module - 10

Session- 19	Session - 20
Read Complex JSON files Styling Tabulation Distribution of Data - Histogram Box Plot Data Visualization - Recap Pie Chart Donut Chart Stacked Bar Plot	Relative Stacked Bar Plot Stacked Area Plot Scatter Plots Bar Plot Continuous vs Continuous Plot Line Plot Line Plot Covid Data

Module - 11

Session- 21	Session - 22
Dash by ploty setup Dash core components Style our Dash Application	Callbacks, Adding interactivity to our Dash Apps using Callbacks

Module - 12

Session- 23	Session - 24
Handling missing data Techniques to impute missing values	Outlier detection and correction Meaningful data transformation

Encoding the data	Assessment

Module - 13

Session- 25	Session - 26
How computers process and understand images, Pixel Basic Properties of Images Greyscale, Processing Pixel Values Masking Image Processing	Text data preprocessing Cleaning Text Data Exploratory Data Analysis on Image and text data Assessment

Module - 14

Session- 27	Session - 28
Introduction to machine learning Expert systems and 6 Jars Supervised Learning - Regression and Classification Evaluation metrics and measuring accuracy Introduction to regression	Interpreting models Feature selection Regularization - Ridge and Lasso

Module - 15

Session- 29	Session - 30
Introduction to classification Evaluation metrics - TP, FP, and AUC Classification using logistic regression	Classification using KNN SVM

Module - 16

Session- 31	Session - 32
Introduction to decision trees Building, pruning, and interpreting trees Ensemble techniques - Bagging and boosting	Random forests Boosted trees - Gradient boosting

Module - 17

Session- 33	Session - 34
Comparison of supervised techniques - when to use what? Do's and Don'ts while training ML models Handling imbalanced data	Undersampling Oversampling Other methods - ROSE, SMOTE, etc

Module - 18

Session- 35	Session - 36
Introduction to unsupervised learning Market Basket Analysis	K means algorithm Assessment

Module - 19

Session- 37	Session - 38
Syntactic Analysis Tokenization Part of Speech Tagging (PoS Tagging)	Lemmatization and Stemming Stop word removal

Module - 20

Session- 39	Session - 40
Semantic Analysis Word sense disambiguation	Relationship extraction Sentiment Analysis, Text extraction

Module - 21

Session- 41	Session - 42
Case Study - I: Credit Card Fraud detection Case Study - II: Airline Customer segmentation	Case Study - III: Product recommendation engine