

DATE	TOPICS
Module 1: SQL (3 Weeks)	
Week 1	<ul style="list-style-type: none">• Introduction to Data Science • Life cycle of data science • Skills required for data science • Applications of data science in different industries • CRISP-DM : Business Understanding Data Understanding, Data Preparation, Modeling, Evaluation and Deployment• Introduction to SQL • Why Data Scientist should know MySQL • Understanding Databases: ▪ What is a Database ▪ Why uses Database ▪ Types of Databases: Relational and Non-Relational Databases• Understanding Database Management System (DBMS) ▪ What is DBMS? ▪ Types of DBMS • Understanding SQL ▪ What is SQL? ▪ Why Use SQL? ▪ Common Practice in Writing SQL Queries ▪ Types of SQL Commands
Week 2	<ul style="list-style-type: none">• SQL Commands: ▪ SELECT, WHERE, AS, ORDER BY, GROUP BY etc. • Joining Tables: ▪ Inner Join ▪ Left Join ▪ Right Join ▪ Full Outer Join ▪ Cross Join • Conditional Statement • Sub Queries • Creating Database • Creating Tables • SQL Constraints• SQL Datatypes • SQL Keys • Inserting Data into Database Tables • Importing and Exporting Data in SQL • Data Cleaning with SQL • Data Analysis with SQL
Week 3	<ul style="list-style-type: none">• SQL Sub Queries • SQL CTEs • SQL Views • SQL Window Functions
SQL MINI PROJECT	
Module 2: Python, Libraries and Databases (4 Weeks)	
Week 4	<ul style="list-style-type: none">• Basics Python for data science • Why Python for Data Science • Installation (VSCode, Anaconda, Python) • Operators ▪ Variables ▪ Variables and data types ▪ Indexing and Slicing ▪ data types operation• Conditional Statements (If, Elif and Else Statements), Logical Operators , • While Loops • For Loops • Nested Condition and Loops • List and Dictionary Comprehensions

- Functions • Function definition and invoking • return keyword • Variable Scope • Arguments: Positional and Keyword • Lambda Functions • Map, • Filter • Reduce

Week 5

- File Handlings Create, Read, Write files and Oper tions in File • Handling Errors and Exception Handling • Connecting to Database • SQLITE • MYSQL

- Working with Python Libraries ▪ Introduction ▪ Datetime ▪ json ▪ csv ▪ faker , requests, BeautifulSoup etc

Week 6

- WebScraping using requests, BeautifulSoup etc.

- Class and Objects • Creat a class Create a object • The __init__() method • Modifying Objects • Self • Modify the Object Properties • Delete Object • Pass Statements • Inheritance • Overriding • Encapsulation

Week 7

PYTHON CAPTONE PROJECT

Module 3: Exploratory Data Analysis and GIT (4 Weeks)

- Numerical Python with Numpy Library ▪ Introduction ▪ Creating Numpy Array ▪ Array Datatypes ▪ Array Manipulation ▪ Data Manipulation with Pandas Library ▪ Pandas DataFrame and Series ▪ Reindexing ▪ Iteration ▪ Sorting ▪ Aggregation ▪ Missing Data ▪ GroupBY ▪ Merging/Joining ▪ Concatenation ▪ Filtering ▪ Descriptive Statistics ▪ Removing Duplicates ▪ String Manipulation ▪ Missing Data Handling

Week 8

- Data Visualization • Introduction to Matplotlib • Basic Plotting • Properties of plotting • About Subplots • Line plots • pie chart and Bar Graph • Histograms • Box and Violin Plots • Scatterplot • Seaborn Library
- What is Exploratory Data Analysis (EDA)? • Uni - Variate Analysis • Bi - Variate Analysis • Multi-Variate Analysis • More on Seaborn Based Plotting Including Pair Plots, Catplot, Heat Maps, Count plot along with matplotlib plots.

Week 9

- What is Exploratory Data Analysis (EDA)? • Uni - Variate Analysis • Bi - Variate Analysis • Multi-Variate Analysis • More on Seaborn Based Plotting Including Pair Plots, Catplot, Heat Maps, Count plot along with matplotlib plots.

- **GIT/GITHUB** • Installation • Introduction to Git & Github • Getting started on GitHub • Local Repository Workflow • Creating a Git repository • Creating and editing files • Adding files to your Git repository

Week 10

- Create a GitHub repo • Git Push • Git Pull
- Understanding Branches • Working with Branches • Pull Requests • Merging and Pull Requests • The General Workflow
- Statistics for Data Science Part 1: • Statistics and its types • Data Types and Measurement levels • Random Variable Data types • Data Collection Techniques • Sampling Techniques • Descriptive Statistics • Measure of Central Tendency • Measure of Dispersion • Frequency Distribution • Propability distribution

Week 11

- Statistics for Data Science Part 2 • Skewness • Kuetosis • Graphical Representation • Histogram Plot • Box Plot • Bar Chart • 5 Number Summary • Detecting Outliers • Removing Outliers • Hypothesis Testing

Module 4: Machine Learning: Supervised (4 Weeks)

- Introduction to Machine Learning • Types of Machine Learning: Supervised Versus Unsupervised Learning • Simple **Linear Regression** • Estimating the Coefficients • Assessing the Intercept and Coefficient Estimates • R Squared and Adjusted R Squared • **MSE** and **RMSE**

Week 12

- **Multiple Linear Regression** • Estimating the Regression Coefficients • OLS Assumptions • Multicollinearity • Feature Selection • Gradient Discent • **Polynomial Regression** • Creating polynomial linear regression • e valuating the metrics • Regularization Techniques • **Lasso Regularization** • **Ridge Regularization**
- **Decision Trees** • Decision Trees (Rule Based Learning): • Basic Terminology in Decision Tree • Root Node and Terminal Node • Regression Trees and Classification Trees • Trees Versus Linear Models • Advantages and Disadvantages of Trees • Gini Index • Overfitting and Pruning • Stopping Criteria • Accuracy Estimation using Decision Trees

Week 13

- **Ensemble Methods** in Tree Based Models • What is Ensemble Learning? • What is Bootstrap Aggregation Classifiers and how does it
- Classification Techniques • An Overview of Classification • Difference Between Regression and classification Models. • Why Not Linear

Week 14

- Naïve Bayes • Principle of Naive Bayes Classifier • Bayes Theorem • Terminology in Naive Bayes • Posterior probability • Prior probability
- **DISTANCE BASED MODULES** • K Nearest Neighbors • K-Nearest Neighbor Algorithm • E ger Vs Lazy learners • How does the KNN algorithm work? • How do you

Week 15

- **Support Vector Machines** • The Maximal Margin Classifier • HyperPlane • Support Vector Classifiers and Support Vector Machines • Hard and Soft Margin Classification • Classification with Non-linear Decision Boundaries • Kernel Trick • Polynomial and Radial • Tuning Hyper parameters for SVM • Gamma, Cost and Epsilon • SVMs with More than Two Classes

Module 5: Deep Learning

	<ul style="list-style-type: none"> • Introduction to Neural Networks • Activation functions a)Sigmoid b) Relu c)Softmax d)Leaky Relu e)Tanh • Gradient Descent • Learning Rate and tuning • Optimization functions • Introduction to Tensorflow • Introduction to keras • Back propagation and chain rule • Fully connected layer • Cross entropy • Weight Initialization • Regularization
Week 16	<ul style="list-style-type: none"> • Pytorch • Pytorch • basic syntax • Pytorch Graphs • Tensorboard • Artificial Neural Network with Pytorch • Neural Network for • Introduction to Statistical NLP Techniques • Introduction to NLP • Preprocessing , NLP Tokenization, stop words, normalization,
Week 17	<ul style="list-style-type: none"> • Word embedding • Word2vec • Golve • POS Tagger • Named Entity Recognition(NER) • POS with NLTK • TF-IDF with NLTK • Sequential Models Introdcution to sequential models • Introduction to RNN • Intro to LSTM • LSTM forward pass • LSTM backprop
Week 18	<ul style="list-style-type: none"> • Applications Sentiment Analysis • Sentence generation •Machine translation •Advanced LSTM structures • Keras- machine translation
Module 6: Power BI (3 Weeks)	
	Power BI Course Outline: <ul style="list-style-type: none"> • Getting Started ▪ An Introduction to Power BI ▪ What is Power BI? ▪ The Building Blocks of Power BI ▪ The Power • Creating a Report with Visualizations ▪ Using the Visualizations Pane ▪ Using the Fields Pane ▪ Creating a Visualization ▪ Interacting with Visualizations ▪ Changing the Visualization Type ▪ Moving and Resizing Visualizations • Doing More with Visualizations ▪ Formatting Visualizations ▪ Viewing Visualization Data ▪ Using Focus Mode and Spotlight ▪ Removing a Visualization • Data Modeling ▪ What is DAX? ▪ Creating a New Table ▪ Creating a New Calculated Column ▪ Creating a New Measure • Managing
Week 19	
Week 20	<ul style="list-style-type: none"> • Continuation on DAX (Part 2) • A Closer Look at Visualizations ▪ Matrixes, Tables, and Charts ▪ Creating a Table ▪ Creating a Matrix • Report Building in PowerBI ▪
Week 21	POWERBI CAPTONE PROJECT
Capstone Project and Examination	
Week 22	Capstone Project and Examination
Week 23	Capstone Project and Examination
Week 24	Capstone Project and Examination