CURRICULUM OUTLINE

	TOPIC	LECTUR	TOTAL DURATION
BEGINNER	**Beginner Modules**	**48**	**16 Weeks (4 Months)**
	Tableau + Excel	12	4 Weeks (1 Month)
	SQL	12	4 Weeks (1 Month)
	Beginner Python	24	8 Weeks (2 Months)
INTERMEDIATE	**Data Analysis and Visualization[1]**	**48**	**16 Weeks (4 Months)**
	Python libraries	12	4 Weeks (1 Month)
	Probability and Applied Statistics	24	8 Weeks (2 Months)
	Product Analytics	12	4 Weeks (1 Month)

ADVANCED	**Foundations of Machine Learning and Deep Learning**	**48**	**16 Weeks (4 Months)**
	Advanced Python	12	4 Weeks (1 Month)
	Math for Machine Learning	12	4 Weeks (1 Month)
	Introduction to Neural Networks and Machine Learning	12	4 Weeks (1 Month)
SPECIALISATION	**Machine Learning**		
	Machine Learning 1: Supervised	24	8 Weeks (2 Months)
	Machine Learning 2: Unsupervised and Recommender systems	12	4 Weeks (1 Month)
	OR/ AND[2]		
	Deep Learning		
	Neural Networks	12	4 Weeks (1 Month)
	Computer vision	12	4 Weeks (1 Month)
	Natural Language Processing	12	4 Weeks (1 Month)
	ADDITIONAL MODULES		
	Machine Learning Ops [3]	**12**	**4 Weeks (1 Month)**
	Advanced Data Structures and Algorithms [4]	**48**	**16 Weeks (4 Months)**

[1]Placement assistance for Data Analyst/Product Analyst roles via Mastery based evaluation starts after completion of this module

[2]You can pursue the Deep Learning specialisation after completing Machine Learning specialisation or vice versa

[3]After completion of this module Placement assistance for Data Scientist (ML/DS) roles via Mastery based evaluation will start

[4]These are recorded lectures

[*]Not an entry point for intermediate learners. An intermediate learner can choose/skip any of the above topics

A DEEPER DIVE INTO THE **CURRICULUM**

Note: Listed below is the detailed insight into the Data Science and Machine Learning curriculum with

BEGINNER MODULE (4 MONTHS)

Topics Covered:

01 Tableau + Excel

Basic Visual Analytics

More Charts and Graphs, Operations on Data and Calculations in Tableau

Advanced Visual Analytics and Level Of Detail (LOD) Expressions

Geographic Visualizations, Advanced Charts, and Worksheet and Workbook Formatting.

Introduction to Excel and Formulas

Pivot Tables, Charts and Statistical functions

Google Spreadsheets

02 SQL

Introduction to Databases & BigQuery Setup

Extracting data using SQL

Functions, Filtering and Subqueries

Joins

GROUP BY & Aggregation

Window Functions

Date and Time Functions & CTEs

Indexes and Partitioning

03 Beginner Python

Flowcharts, Data Types, Operators

Conditional Statements & Loops

Functions

Strings

In-built Data Structures - List, Tuple, Dictionary, Set, Matrix Algebra, Number Systems

Get the hang of the predominant industry tool, Tableau, for visualising, dashboarding & reporting to ace your role as a Data Analyst, Data Scientist or ML Engineer.

INTERMEDIATE MODULE: DATA ANALYSIS AND VISUALIZATION (4 MONTHS)

Topics Covered:

01 Python Libraries

Numpy, Pandas

Matplotlib

Seaborn

Data Acquisition

Web API

Web Scraping

Beautifulsoup

Tweepy

02 Probability and Applied Statistics

Probability

Bayes Theorem

Distributions

Descriptive Statistics, outlier treatment

Confidence Interval

Central Limit Theorem

Hypothesis Test, AB Testing

ANOVA

Correlation

EDA, Feature Engineering, Missing value treatment

Experiment Design

Regex, NLTK, OpenCV

03 Product Analytics

Framework to address product sense questions

Diagnostics

Metrics, KPI

Product Design & Development

Guesstimates

Product Cases from Netflix, Stripe, Instagram

Outshine your Problem-Solving skills as you learn to break down business situations, design correct metrics & deal with uncertainty.

From Emergency Call Centre to Casino of Las Vegas - Experience

Probability & Statistics with a fresh perspective.

ADVANCED MODULE: FOUNDATIONS OF MACHINE LEARNING AND DEEP LEARNING * (3 MONTHS)

Topics Covered:

01 Advanced Python

Python Refresher

Basics of Time and Space Complexity

OOPS

Functional Programming

Exception Handling and Modules

02 Math for Machine Learning

Classification

Hyperplane

Halfspaces

Calculus

Optimization

Gradient descent

Principal Component Analysis

03

Introduction to Neural Networks and Machine Learning

Introduction to Classical Machine Learning

Linear Regression

Polynomial, Bias-Variance, Regularisation

Cross Validation

Logistic Regression-2

Perceptron and Softmax Classification

Introduction to Clustering, K-Means

K-means ++, Hierarchical

Solidify your fundamentals & Fall in love with Mathematics as you solve engaging problems - from Drone Delivery to Soccer Matches.

SPECIALISATIONS (3 MONTHS)

Topics Covered:

MACHINE LEARNING

01 Machine Learning 1: Supervised

MLE, MAP, Confidence Interval

Classification Metrics

Imbalanced Data

Decision Trees

Bagging

Naive Bayes

SVM

02

Machine Learning 2: Unsupervised and Recommender systems

Introduction to Clustering, k-Means

K-means ++, Hierarchical

GMM

Anomaly/Outlier/Novelty Detection

PCA, t-SNE

Recommender Systems

Time Series Analysis

Be it forecasting the exact number of orders to be placed at a restaurant on New Year's Eve or forecasting the number of oxygen cylinders a hospital will require. Scaler will ensure you get a hold of both the situations like a Pro!

OR/AND [2]

DEEP LEARNING

01 Neural Networks

Perceptrons

Neural Networks

Hidden Layers

Tensorflow

Keras

Forward and Back Propagation

Multilayer Perceptrons (MLP)

Callbacks

Tensorboard

Optimization

Hyperparameter tuning

02 Computer Vision

Convolutional Neural Nets

Data Augmentation

Transfer Learning

CNN

CNN Hyperparameters Tuning & BackPropagation

CNN Visualization

Popular CNN Architecture - Alex, VGG, ResNet,

Inception, EfficientNet, MobileNet

Object Segmentation, Localisation, and Detection

Generative Models, GANs

Attention Models

Siamese Networks

Advanced CV

02 Natural Language Processing

Text Processing and Representation

Tokenization, Stemming, Lemmatization

Vector space modelling, Cosine Similarity, Euclidean Distance

POS tagging, Dependency parsing

Topic Modeling, Language Modeling

Embeddings

Recurrent Neural Nets

Information Extraction

LSTM

Attention

Named Entity Recognition

Transformers

HuggingFace

BERT

Work on projects built in partnership with top companies. Get your hands dirty by working with messy and unclean real-world data. Prepare for Data Science & Machine Learning interviews by getting your hands-on essential Problem-Solving skills.

MACHINE LEARNING OPS ^{3} (1 MONTH)

Topics Covered:

01 Machine Learning Ops

Streamlit

Flask

Containerisation, Docker

Experiment Tracking

MLFlow

CI/CD

GitHub Actions

ML System Design

AWS Sagemaker, AWS Data Wrangler, AWS Pipeline

Apache Spark

Spark ML lib

Don’t stop at just building the models, learn to develop end-to-end ML pipelines. Build applications powered by your Machine Learning models. Work with the latest Cloud Platforms to deploy these apps and monitor your models

ADVANCED-DATA STRUCTURES AND ALGORITHMS ^{4} (4 MONTHS)

Topics Covered:

- Linked Lists
- Stacks & Queues
- Trees
- Tries & Heaps

This is where you get 100x better than mediocre Data Scientists. Take the leap from a good to a great Data Scientist by learning to solve problems in the simplest & fastest way possible.