# Road Map :
# AI Engineer /
# Data Scientiest
# From
# Beginner


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# Python - ML
# Course Syllabus

## Python

Introduction to Python
Python Basics
Program Flow
Functions & Modules
Exception Handling
File Handling
Classes In Python
Generators
Data Structures
Collections
Advances Topics

## Machine Learning

Introduction to ML
Exploratory Data Analysis
Hypothesis Testing
Linear Regression
Logistic Regression
Naive Bayes
Advanced Regression
Tree Model
Boosting
Unsupervised Learning
NLP
Deep Learning
Reinforcement Learning

Course Duration : 60+ Hours
Course Language : Tamil
Mode : Online
Time : Weekend (7am - 9am)
Diffcuilty : Basic
Prerequisite : None

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# PYTHON

## Introduction to Python

What can Python do?
Python Syntax compared
to other languages

## Beginning of Python Basics

The printstatement
Comments
Python Data Structures &
Data Types
String Operations in
Python
Simple Input & Output
Simple Output Formatting
Operators in python

## Python Program Flow

If-statement,
For Loop,
While statement ,
The range
statement,
Break &Continue
Assert ,
Examples for
looping.

## Exceptions Handling

Exception
handling with try,
handling Multiple
Exceptions,
Writing your own
Exception.

## File Handling

Reading Files
Writing &
Appending to Files

## Classes In Python

New Style Classes
Creating Classes
Instance Methods
OOPS Concepts
Exception Classes
& Custom
Exceptions

## Generators and iterators

Iterators
Generators
The Functions
any and all

## Collections

Namedtuple()
deque
ChainMap
Counter
OrderedDict

## Data Structures

List Comprehensions
Nested List
Comprehensions
Dictionary
Comprehensions

## Functions & Modules

Create your own functions
Functions Parameters
Variable Arguments
Scope of a Function
Function Documentation
Lambda Functions& map
Exercise with functions
Create a Module
Standard Modules

## Advanced Adhoc Topics

Accessing SQL database using python,
Filter
Map
Reduce
Decorators
Multi-Threading
Regular Expression
Enum
Logger
Config Loader
Argument Parser
Pandas
Pandas SQL

# MACHINE LEARNING

## ML-1

### Introduction to Machine Learning

What is Machine Learning,
Types,
Introduction to Python. Packages used in ML.
Basic Math.

### Exploratory Data Analysis

Data Sourcing,
Data Cleaning,
Univariate Analysis,
Bivariate Analysis,
Derived Metrics.

### Hypothesis Testing

Central Limit Theorem,
Critical Value Method,
Z-Test,
T-test,
Chi-Square test,
ANOVA test.

### Linear Regression

Introduction,
Math behind building Simple Linear Regression,
Simple linear Regression,
Multiple Linear Regression,
Building and Evaluating model using python,
Hands-On.

### Logistic Regression

Univariate Logistic Regression,
Multivariate Logistic Regression,
Math behind Logistic Regression ,
Building and Evaluating model using python
Hands-On

### Naïve Bayes

Baye's Theorem,
Naïve Bayes for categorical date,
Naïve Bayes for text classification,
Hands-On.

# ML-2

## Advances Regression

Understanding Overfitting and Underfitting,
Handling Non-Linear Data,
L1 and L2 Regularization
SVM.

## Tree Model

Introduction to decision tree,
Algorithm for decision tree,
Hyperparameter Tuning in decision tree,
Ensembles and Random Forest,
Hands-On.

## Boosting

Introduction To boosting,
ADA boost,
XG boost,
Math behind boosting,
Hands-On.

## Unsupervised

PCA,
K – Means,
Hierarchical Clustering,
Hands-On.

## Natural Language Processing

## Lexical Processing

Introduction to NLP ,
Basic of Lexical Processing,
Advanced Lexical Processing,
Hands-On.

## Syntactic Processing

Introduction,
POS Tagging,
Parsing,
NER and CRF,
Hands-On.

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## Semantic Processing

Knowledge Graph,
Basic Concept,
Advanced
Concept,
Hands-On.

# Deep Learning

## Neural Network

Introduction,
Math behind
ANN(Forward and
Backword
Propagation).
Building plain vanilla
ANN using Python.
Building ANN using
Tensorflow, Keras,
Hands-On.

## Convolution Neural Network

Introduction,
Match behind CNN,
Building CNN using
python and keras,
Hands-On

## Recurrent Neural Network

Introduction,
Theoretical concept,
Building Basic RNN
using python.
Hands-On.

## Object Detection Advanced

Yolo, darknet,
OpenCV,
Image
Segmentation,
Custom Object
detection (Hands-
On).

## Reinforcement Learning

Basic
Concept,
Theoretical
discussion.