## <https://datamites.com/python-training/machine-learning-with-python/>

## SYLLABUS OF DATA SCIENCE COURSE IN RAIPUR

### [PYTHON FOUNDATION – 6 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne256)

**MODULE 1: PYTHON BASICS**

• Introduction of python  
• Installation of Python and IDE  
• Python objects  
• Python basic data types  
• Number & Booleans, strings  
• Arithmetic Operators  
• Comparison Operators  
• Assignment Operators  
• Operator’s precedence and associativity

**MODULE 2: PYTHON CONTROL STATEMENTS**

• IF Conditional statement  
• IF-ELSE  
• NESTED IF  
• Python Loops basics  
• WHILE Statement  
• FOR statements  
• BREAK and CONTINUE statements

**MODULE 3: PYTHON DATA STRUCTURES**

• Basic data structure in python  
• String object basics and inbuilt methods  
• List: Object, methods, comprehensions  
• Tuple: Object, methods, comprehensions  
• Sets: Object, methods, comprehensions  
• Dictionary: Object, methods, comprehensions

**MODULE 4: PYTHON FUNCTIONS**

• Functions basics  
• Function Parameter passing  
• Iterators  
• Generator functions  
• Lambda functions  
• Map, reduce, filter functions

**MODULE 5: PYTHON NUMPY PACKAGE**

• NumPy Introduction  
• Array – Data Structure  
• Core Numpy functions  
• Matrix Operations

**MODULE 6: PYTHON PANDAS PACKAGE**

• Pandas functions  
• Data Frame and Series – Data Structure  
• Data munging with Pandas  
• Imputation and outlier analysis

### [DATA SCIENCE FOUNDATION – 7 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne257)

**MODULE 1: DATA SCIENCE ESSENTIALS**

• Introduction to Data Science  
• Data Science Terminologies  
• Classifications of Analytics  
• Data Science Project workflow

**MODULE 2: DATA ENGINEERING FOUNDATION**

• Introduction to Data Engineering  
• Data engineering importance  
• Ecosystems of data engineering tools  
• Core concepts of data engineering

**MODULE 3: PYTHON FOR DATA SCIENCE**

• Introduction to Python  
• Python Data Types, Operators  
• Flow Control statements, Functions  
• Structured vs Unstructured Data  
• Python Numpy package introduction  
• Array Data Structures in Numpy  
• Array operations and methods  
• Python Pandas package introduction  
• Data Structures : Series and DataFrame  
• Pandas DataFrame key methods

**MODULE 4: VISUALIZATION WITH PYTHON**

• Visualization Packages (Matplotlib)  
• Components Of A Plot, Sub-Plots  
• Basic Plots: Line, Bar, Pie, Scatter  
• Advanced Python Data Visualizations

**MODULE 5: R LANGUAGE ESSENTIALS**

• R Installation and Setup  
• R STUDIO – R Development Env  
• R language basics and data structures  
• R data structures , control statements

**MODULE 6: STATISTICS**

• Descriptive And Inferential statistics  
• Types Of Data, Sampling types  
• Measures of Central Tendencies  
• Data Variability: Standard Deviation  
• Z-Score, Outliers, Normal Distribution  
• Central Limit Theorem  
• Histogram, Normality Tests  
• Skewness & Kurtosis  
• Understanding Hypothesis Testing  
• P-Value Method, Types Of Errors  
• T Distribution, One Sample T-Test  
• Independent And Relational T Tests  
• Direct And Indirect Correlation  
• Regression Theory

**MODULE 7: MACHINE LEARNING INTRODUCTION**

• Machine Learning Introduction  
• ML core concepts  
• Unsupervised and Supervised Learning  
• Clustering with K-Means  
• Regression and Classification Models.  
• Regression Algorithm: Linear Regression  
• ML Model Evaluation  
• Classification Algorithm: Logistic Regression

### [MACHINE LEARNING EXPERT – 12 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne258)

**MODULE 1: MACHINE LEARNING INTRODUCTION**

• What Is ML? ML Vs AI  
• ML Workflow, Popular ML Algorithms  
• Clustering, Classification, And Regression  
• Supervised Vs Unsupervised

**MODULE 2: ML ALGO: LINEAR REGRESSION**

• Introduction to Linear Regression  
• How it works: Regression and Best Fit Line  
• Modeling and Evaluation in Python

**MODULE 3: ML ALGO: LOGISTIC REGRESSION**

• Introduction to Logistic Regression  
• How it works: Classification & Sigmoid Curve  
• Modeling and Evaluation in Python

**MODULE 4: ML ALGO: KNN**

• Introduction to KNN  
• How It Works: Nearest Neighbor Concept  
• Modeling and Evaluation in Python

**MODULE 5: ML ALGO: K MEANS CLUSTERING**

• Understanding Clustering (Unsupervised)  
• K Means Algorithm  
• How it works : K Means theory  
• Modeling in Python

**MODULE 6: PRINCIPLE COMPONENT ANALYSIS (PCA)**

• Building Blocks Of PCA  
• How it works: Finding Principal Components  
• Modeling PCA in Python

**MODULE 7: ML ALGO: DECISION TREE**

• Random Forest Ensemble technique  
• How it works: Bagging Theory  
• Modeling and Evaluation in Python

**MODULE 8: ML ALGO: NAÏVE BAYES**

• Introduction to Naive Bayes  
• How it works: Bayes' Theorem  
• Naive Bayes For Text Classification  
• Modeling and Evaluation in Python

**MODULE 9: GRADIENT BOOSTING, XGBOOST**

• Introduction to Boosting and XGBoost  
• How it works: weak learners' concept  
• Modeling and Evaluation of in Python

**MODULE 10: ML ALGO: SUPPORT VECTOR MACHINE (SVM)**

• Introduction to SVM  
• How It Works: SVM Concept, Kernel Trick  
• Modeling and Evaluation of SVM in Python

**MODULE 11: ARTIFICIAL NEURAL NETWORK (ANN)**

• Introduction to ANN  
• How It Works: Back prop, Gradient Descent  
• Modeling and Evaluation of ANN in Python

**MODULE 12: ADVANCED ML CONCEPTS**

• Adv Metrics (Roc\_Auc, R2, Precision, Recall)  
• K-Fold Cross-validation  
• Grid And Randomized Search CV In Sklearn  
• Imbalanced Data Set: Smote Technique  
• Feature Selection Techniques

### [ADVANCED DATA SCIENCE – 8 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne259)

**MODULE 1: TIME SERIES FORECASTING - ARIMA**

• What is Time Series?  
• Trend, Seasonality, cyclical and random  
• Autoregressive Model (AR)  
• Moving Average Model (MA)  
• Stationarity of Time Series  
• ARIMA Model  
• Autocorrelation and AIC

**MODULE 2: FEATURE ENGINEERING**

• Introduction to Features Engineering  
• Transforming Predictors  
• Feature Selection methods  
• Backward elimination technique  
• Feature importance from ML modeling

**MODULE 3: SENTIMENT ANALYSIS**

• Introduction to Sentiment Analysis  
• Python packages: TextBlob, NLTK  
• Case study: Twitter Live Sentiment Analysis

**MODULE 4: REGULAR EXPRESSIONS WITH PYTHON**

• Regex Introduction  
• Regex codes  
• Text extraction with Python Regex

**MODULE 5: ML MODEL DEPLOYMENT WITH FLASK**

• Introduction to Flask  
• URL and App routing  
• Flask application – ML Model Deployment

**MODULE 6: ADVANCED DATA ANALYSIS WITH MS EXCEL**

• MS Excel core Functions  
• Pivot Table  
• Advanced Functions (VLOOKUP, INDIRECT..)  
• Linear Regression with EXCEL  
• Goal Seek Analysis  
• Data Table  
• Solving Data Equation with EXCEL  
• Monte Carlo Simulation with MS EXCEL

**MODULE 7: AWS CLOUD FOR DATA SCIENCE**

• Introduction of cloud  
• Difference between GCC, Azure, AWS  
• AWS Service ( EC2 and S3 service)  
• AWS Service (AMI), AWS Service (RDS)  
• AWS Service (IAM), AWS (Athena service)  
• AWS (EMR), AWS, AWS (Redshift)  
• ML Modeling with AWS Sage Maker

**MODULE 8: AZURE FOR DATA SCIENCE**

• Introduction to AZURE ML studio  
• Data Pipeline and ML modeling with Azure

### [VERSION CONTROL WITH GIT – 6 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne260)

**MODULE 1: GIT INTRODUCTION**

• Purpose of Version Control  
• Popular Version control tools  
• Git Distribution Version Control  
• Terminologies  
• Git Workflow  
• Git Architecture

**MODULE 2: GIT REPOSITORY and GitHub**

• Git Repo Introduction  
• Create New Repo with Init command  
• Copying existing repo  
• Git user and remote node  
• Git Status and rebase  
• Review Repo History  
• GitHub Cloud Remote Repo

**MODULE 3: COMMITS, PULL, FETCH AND PUSH**

• Code commits  
• Pull, Fetch and conflicts resolution  
• Pushing to Remote Repo

**MODULE 4: TAGGING, BRANCHING, AND MERGING**

• Organize code with branches  
• Checkout branch  
• Merge branches

**MODULE 5: UNDOING CHANGES**

• Editing Commits  
• Commit command Amend flag  
• Git reset and revert

**MODULE 6: GIT WITH GITHUB AND BITBUCKET**

• Creating GitHub Account  
• Local and Remote Repo  
• Collaborating with other developers  
• Bitbucket Git account

### [BIG DATA FOUNDATION – 6 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne261)

**MODULE 1: BIG DATA INTRODUCTION**

• Big Data Overview  
• Five Vs of Big Data  
• What is Big Data and Hadoop  
• Introduction to Hadoop  
• Components of Hadoop Ecosystem  
• Big Data Analytics Introduction

**MODULE 2: HDFS AND MAP REDUCE**

• HDFS – Big Data Storage  
• Distributed Processing with Map Reduce  
• Mapping and reducing stages concepts  
• Key Terms: Output Format, Partitioners, Combiners, Shuffle, and Sort  
• Hands-on Map Reduce task

**MODULE 3: PYSPARK FOUNDATION**

• PySpark Introduction  
• Spark Configuration  
• Resilient distributed datasets (RDD)  
• Working with RDDs in PySpark  
• Aggregating Data with Pair RDDs

**MODULE 4: SPARK SQL and HADOOP HIVE**

• Introducing Spark SQL  
• Spark SQL vs Hadoop Hive  
• Working with Spark SQL Query Language

**MODULE 5: MACHINE LEARNING WITH SPARK ML**

• Introduction to MLlib Various ML algorithms supported by MLib  
• ML model with Spark ML.  
• Linear regression  
• logistic regression  
• Random forest

**MODULE 6: KAFKA and Spark**

• Kafka architecture  
• Kafka workflow  
• Configuring Kafka cluster  
• Operations

### [CERTIFIED BI ANALYST – 6 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne262)

**MODULE 1: BUSINESS INTELLIGENCE INTRODUCTION**

• What Is Business Intelligence (BI)?  
• What Bi Is The Core Of Business Decisions?  
• BI Evolution  
• Business Intelligence Vs Business Analytics  
• Data Driven Decisions With Bi Tools  
• The Crisp-Dm Methodology

**MODULE 2: BI WITH TABLEAU: INTRODUCTION**

• The Tableau Interface  
• Tableau Workbook, Sheets And Dashboards  
• Filter Shelf, Rows And Columns  
• Dimensions And Measures  
• Distributing And Publishing

**MODULE 3: TABLEAU: CONNECTING TO DATA SOURCE**

• Connecting To Data File , Database Servers  
• Managing Fields  
• Managing Extracts  
• Saving And Publishing Data Sources  
• Data Prep With Text And Excel Files  
• Join Types With Union  
• Cross-Database Joins  
• Data Blending  
• Connecting To Pdfs

**MODULE 4: TABLEAU: BUSINESS INSIGHTS**

• Getting Started With Visual Analytics  
• Drill Down And Hierarchies  
• Sorting & Grouping  
• Creating And Working Sets  
• Using The Filter Shelf  
• Interactive Filters  
• Parameters  
• The Formatting Pane  
• Trend Lines & Reference Lines  
• Forecasting  
• Clustering

**MODULE 5: DASHBOARDS, STORIES AND PAGES**

• Dashboards And Stories Introduction  
• Building A Dashboard  
• Dashboard Objects  
• Dashboard Formatting  
• Dashboard Interactivity Using Actions  
• Story Points  
• Animation With Pages

**MODULE 6: BI WITH POWER-BI**

• Power BI basics  
• Basics Visualizations  
• Business Insights with Power BI

### [DATABASE: SQL AND MONGODB – 7 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne263)

**MODULE 1: DATABASE INTRODUCTION**

• DATABASE Overview  
• Key concepts of database management  
• CRUD Operations  
• Relational Database Management System  
• RDBMS vs No-SQL (Document DB)

**MODULE 2: SQL BASICS**

• Introduction to Databases  
• Introduction to SQL  
• SQL Commands  
• MY SQL workbench installation  
• Comments  
• import and export dataset

**MODULE 3: DATA TYPES AND CONSTRAINTS**

• Numeric, Character, date time data type  
• Primary key, Foreign key, Not null  
• Unique, Check, default, Auto increment

**MODULE 4: DATABASES AND TABLES (MySQL)**

• Create database  
• Delete database  
• Show and use databases  
• Create table, Rename table  
• Delete table, Delete table records  
• Create new table from existing data types  
• Insert into, Update records  
• Alter table

**MODULE 5: SQL JOINS**

• Inner join  
• Outer join  
• Left join  
• Right join  
• Cross join  
• Self join

**MODULE 6: SQL COMMANDS AND CLAUSES**

• Select, Select distinct  
• Aliases, Where clause  
• Relational operators, Logical  
• Between, Order by, In  
• Like, Limit, null/not null, group by  
• Having, Sub queries

**MODULE 7: DOCUMENT DB/NO-SQL DB**

• Introduction of Document DB  
• Document DB vs SQL DB  
• Popular Document DBs  
• MongoDB basics  
• Data format and Key methods  
• MongoDB data management

### [ARTIFICIAL INTELLIGENCE FOUNDATION – 6 MODULES](https://datamites.com/data-science-course-training-raipur/#collapseOne264)

**MODULE 1: ARTIFICIAL INTELLIGENCE OVERVIEW**

• Evolution Of Human Intelligence  
• What Is Artificial Intelligence?  
• History Of Artificial Intelligence.  
• Why Artificial Intelligence Now?  
• Ai Terminologies  
• Areas Of Artificial Intelligence  
• Ai Vs Data Science Vs Machine Learning

**MODULE 2: DEEP LEARNING INTRODUCTION**

• Deep Neural Network  
• Machine Learning vs Deep Learning  
• Feature Learning in Deep Networks  
• Applications of Deep Learning Networks

**MODULE 3: TENSORFLOW FOUNDATION**

• TensorFlow Installation and setup  
• TensorFlow Structure and Modules  
• Hands-On: ML modeling with TensorFlow

**MODULE 4: COMPUTER VISION INTRODUCTION**

• Image Basics  
• Convolution Neural Network (CNN)  
• Image Classification with CNN  
• Hands-On: Cat vs Dogs Classification with CNN Network

**MODULE 5: NATURAL LANGUAGE PROCESSING (NLP)**

• NLP Introduction  
• Bag of Words Models  
• Word Embedding  
• Language Modeling  
• Hands-On: BERT Algorithm

**MODULE 6: AI ETHICAL ISSUES AND CONCERNS**

• Issues And Concerns Around Ai  
• Ai And Ethical Concerns  
• Ai And Bias  
• Ai: Ethics, Bias, And Trust

**Statistics for Economics Class 11**

* [Chapter 1 Introduction](https://www.learncbse.in/statistics-for-economics-class-11-notes-chapter-1/)
* [Chapter 2 Collection of Data](https://www.learncbse.in/statistics-for-economics-class-11-notes-chapter-2/)
* [Chapter 3 Organisation of Data](https://www.learncbse.in/statistics-for-economics-class-11-notes-chapter-3/)
* [Chapter 4 Presentation of Data](https://www.learncbse.in/statistics-for-economics-class-11-notes-chapter-4/)
* [Chapter 5 Measures of Central Tendency](https://www.learncbse.in/statistics-for-economics-class-11-notes-chapter-5/)
* [Chapter 6 Measures of Dispersion](https://www.learncbse.in/statistics-for-economics-class-11-notes-chapter-6/)
* [Chapter 7 Correlation](https://www.learncbse.in/statistics-for-economics-class-11-notes-chapter-7/)
* [Chapter 8 Index Numbers](https://www.learncbse.in/statistics-for-economics-class-11-notes-chapter-8/)

**Mathematics Class 11**

* [Chapter 1 Sets](https://www.learncbse.in/cbse-maths-solutions-class-11th-chapter-1-sets/)
* [Chapter 2 Relations and Functions](https://www.learncbse.in/ncert-class-11-solutions-maths-chapter-2-relations-functions/)
* [Chapter 3 Trigonometric Functions](https://www.learncbse.in/cbse-free-ncert-solutions-for-class-11th-maths-chapter-3-trigonometric-functions/)
* [Chapter 4 Principle of Mathematical Induction](https://www.learncbse.in/ncert-solutions-class-11th-maths-chapter-4-principle-mathematical-induction/)
* [Chapter 5 Complex Numbers and Quadratic Equations](https://www.learncbse.in/ncert-solutions-for-class-11th-maths-chapter-5-complex-numbers-and-quadratic-equations/)
* [Chapter 6 Linear Inequalities](https://www.learncbse.in/free-ncert-solutions-for-class-11th-maths-chapter-6-linear-inequalities/)
* [Chapter 7 Permutation and Combinations](https://www.learncbse.in/ncert-solutions-for-class-11th-maths-chapter-7-permutation-and-combinations/)
* [Chapter 8 Binomial Theorem](https://www.learncbse.in/ncert-solutions-for-class-11th-maths-chapter-8-binomial-theorem/)
* [Chapter 9 Sequences and Series](https://www.learncbse.in/ncert-solutions-for-class-11th-maths-chapter-9-sequences-and-series/)
* [Chapter 10 Straight Lines Exercise 10.1](https://www.learncbse.in/free-ncert-solutions-class-11th-maths-chapter-10-straight-lines/)
* [Chapter 11 Conic Sections](https://www.learncbse.in/ncert-solutions-for-class-11th-maths-chapter-11-conic-sections/)
* [Chapter 12 Introduction to Three Dimensional Geometry](https://www.learncbse.in/ncert-solutions-for-class-11th-maths-chapter-12-introduction-to-three-dimensional-geometry/)
* [Chapter 13 Limits and Derivatives](https://www.learncbse.in/ncert-solutions-class-11-maths-chapter-13-limits-derivatives/)
* [Chapter 14 Mathematical Reasoning](https://www.learncbse.in/ncert-solutions-for-class-11th-maths-chapter-14-mathematical-reasoning/)
* [Chapter 15 Statistics](https://www.learncbse.in/ncert-solutions-class-11th-maths-chapter-15-statistics/)
* [Chapter 16 Probability](https://www.learncbse.in/ncert-solutions-for-class-11th-maths-chapter-16-probability/)

**Mathematics Class 12**

Part 1

* Chapter 1 Relations and Functions
* Chapter 2 Inverse Trigonometric
* Chapter 3 Matrices
* Chapter 4 Determinants
* Chapter 5 Continuity
* Chapter 6 Application of Derivatives

Part 2

* Chapter 1 Integrals
* Chapter 2 Application of Integrals
* Chapter 3 Differential Equations
* Chapter 4 Vector Algebra
* Chapter 5 Three Dimensional Geometry
* Chapter 6 Linear Programming
* Chapter 7 Probability