

Data Science Course Syllabus



1 Course Overview

Learn Data Science, including Python, statistics, SQL, data visualization, and machine learning. Gain practical skills to clean and analyze data, build predictive models, and present insights from real-world datasets.

Data science helps companies predict customer behaviour, reduce risk and improve products using data. It is one of the most popular and rewarding career paths in technology, and this course gives you a clear, practical starting point.

2 Course Highlights

- Focused core data science course: Python, statistics, SQL and machine learning
- Hands-on practice with real datasets and portfolio projects
- Hands-on practice with assignments in every module
- Resume building, mock interviews and placement guidance

3 Who Can Join

- Students and fresh graduates who want to start a career in data science
- Software and IT professionals who want to move into data science
- Data analysts who want to learn predictive modelling
- Working professionals who want to use data science in their business

4 Course Syllabus

The course is divided into 7 modules. Each module combines concept sessions with hands-on practice.

MODULE 1 Introduction to Data Science and Python Basics

- What is data science and the data science lifecycle
- Roles: data analyst, data scientist and ML engineer
- Installing Python, Jupyter Notebook and Google Colab
- Variables, data types and operators
- Conditions, loops and functions
- Lists, tuples, sets and dictionaries
- File handling and modules

**MODULE 2 Python Libraries: NumPy and Pandas**

- NumPy arrays, indexing and operations
- Pandas Series and DataFrames
- Reading CSV, Excel and JSON data
- Selecting, filtering and sorting data
- Grouping, merging and pivoting data
- Handling missing values and duplicates
- Working with dates and text data

MODULE 3 Statistics and Probability

- Mean, median, mode and standard deviation
- Data distributions and outliers
- Probability basics and the normal distribution
- Sampling and confidence intervals
- Hypothesis testing and p-values
- Correlation and covariance
- Introduction to regression

MODULE 4 SQL and Data Visualization

- Database concepts and SQL basics
- Joins, subqueries and aggregate functions
- Window functions and common table expressions
- Charts with Matplotlib and Seaborn
- Choosing the right chart for the data
- Exploratory data analysis (EDA)
- Dashboards with Power BI or Tableau (introduction)

MODULE 5 Machine Learning with Scikit-learn

- Machine learning types and workflow
- Data preprocessing and feature scaling
- Linear and logistic regression
- Decision trees and random forests
- KNN, SVM and Naive Bayes
- Clustering with K-Means
- Model evaluation and cross-validation

**MODULE 6 Advanced Topics: NLP, Time Series and Deep Learning Basics**

- Text preprocessing and sentiment analysis
- Time series analysis and forecasting basics
- Recommendation system basics
- Neural network concepts
- Introduction to TensorFlow and Keras
- Overview of generative AI and large language models
- Handling imbalanced data and improving models

MODULE 7 Model Deployment, Projects and Career Preparation

- Saving and loading models
- Building a web app with Streamlit
- Introduction to Flask or FastAPI
- End-to-end data science project
- Presenting insights and recommendations
- Building a portfolio and GitHub profile
- Resume, mock interviews and placement guidance

5 Tools and Technologies Covered

Python, NumPy, Pandas, Matplotlib and Seaborn, SQL, MySQL, Scikit-learn, TensorFlow and Keras (introduction), Power BI / Tableau (introduction), Streamlit, Jupyter Notebook, Google Colab, Git and GitHub.

6 Hands-On Projects

House Price Prediction	Regression model with data cleaning and evaluation.
Customer Churn Prediction	Classification model to find customers likely to leave.
Sales Data Analysis	EDA and visualization with business insights.
Sentiment Analysis App	NLP model deployed as a web app with Streamlit.



7 Learning Outcomes

- Write Python programs for data analysis.
- Use NumPy and Pandas to clean and process data.
- Apply statistics and probability to real-world data.
- Query databases using SQL and visualize data effectively.
- Build and evaluate machine learning models.
- Present data-driven insights and deploy a simple model.

8 Career Opportunities

- Data Scientist (entry level)
- Data Analyst
- Machine Learning Associate
- Business Analyst
- Junior AI Developer
- Analytics Associate

9 Course Details

Duration	As per course schedule
Level	Beginner to Advanced
Mode	Online / Classroom
Prerequisites	Basic computer knowledge; school-level mathematics
Certification	Course completion certificate
Support	Placement assistance and interview preparation

10 Frequently Asked Questions

Do I need prior experience to join?

No. The course starts from the basics, so beginners can join. The prerequisite listed in the course details is enough.

Will I get hands-on practice?

Yes. Every module includes practical sessions, assignments and a real-world project.

Do you provide placement support?

Yes. We provide resume building, mock interviews and placement guidance.



Can I attend online?

Yes. The course is available in both online and classroom modes.

11 Contact Information

INSTITUTE NAME	Yuva Sakthi Academy
WEBSITE	https://yuvasakthiacademy.com/
CONTACT NUMBER	+91 95976 84055
EMAIL	yuvasakthiacademy1234@gmail.com