COURSE SYLLABUS

Data Science Masters Program Syllabus

1 Course Overview

Learn Data Science, including Python, statistics, SQL, data visualization, machine learning, deep learning, natural language processing, big data basics, and model deployment. Gain practical skills to analyze data, build predictive models, and solve real business problems.

Data science combines statistics, programming and business understanding to find patterns and make predictions from data. Banks, e-commerce, healthcare and IT companies use data scientists to improve decisions, which makes this one of the most rewarding careers in technology.

2 Course Highlights

- Masters-level path from Python and statistics to machine learning, deep learning and deployment
- Real datasets, case studies and a final capstone project
- 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 a career in data science
- Software developers and testers who want to move into data science roles
- Data analysts who want to grow into machine learning and predictive modelling
- Working professionals who want to apply data science in their field

4 Course Syllabus

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

MODULE 1 Python Programming for Data Science

- Python basics, data types and control flow
- Functions, modules and object-oriented programming
- File handling and exception handling
- NumPy arrays and mathematical operations
- Pandas Series and DataFrames
- Jupyter Notebook and Google Colab
- Git and GitHub basics

MODULE 2 Statistics and Mathematics for Data Science

- Descriptive statistics and data distributions
- Probability and probability distributions
- Sampling and the central limit theorem
- Hypothesis testing and confidence intervals
- Correlation, regression and ANOVA
- Linear algebra: vectors and matrices
- Calculus basics used in machine learning

MODULE 3 SQL, Data Cleaning and Exploratory Data Analysis

- SQL queries, joins and window functions
- Data collection from files, databases and APIs
- Handling missing values and outliers
- Data transformation and feature creation
- Exploratory data analysis (EDA)
- Visualization with Matplotlib, Seaborn and Plotly
- Dashboards with Power BI or Tableau

MODULE 4 Machine Learning: Supervised and Unsupervised

- Machine learning workflow and types
- Feature engineering, scaling and encoding
- Linear and logistic regression
- Decision trees, random forests and boosting
- KNN, SVM and Naive Bayes
- Clustering and PCA
- Model evaluation, cross-validation and hyperparameter tuning

MODULE 5 Deep Learning and Neural Networks

- Neural network basics and activation functions
- Loss functions, gradient descent and backpropagation
- TensorFlow and Keras
- Convolutional Neural Networks for images
- Recurrent networks and sequence data
- Regularization and preventing overfitting
- Transfer learning

MODULE 6 NLP, Time Series and Big Data Basics

- Text preprocessing and tokenization
- Sentiment analysis and text classification
- Word embeddings and transformers overview
- Time series analysis and forecasting
- Recommendation system basics
- Introduction to big data and Apache Spark
- Introduction to generative AI and large language models

MODULE 7 Model Deployment, Capstone Project and Career Preparation

- Saving and loading models
- Building APIs with Flask or FastAPI
- Creating web apps with Streamlit
- MLOps basics and cloud deployment overview
- End-to-end capstone project
- Presenting results to business stakeholders
- Resume, portfolio and interview preparation

5 Tools and Technologies Covered

Python, NumPy, Pandas, Matplotlib and Seaborn, Plotly, SQL, Scikit-learn, TensorFlow and Keras, Power BI / Tableau, PySpark (introduction), Streamlit, Flask / FastAPI, Jupyter Notebook, Git and GitHub.

6 Hands-On Projects

Sales Forecasting	Time series and regression model for future sales.
Customer Churn Prediction	Classification with feature engineering and evaluation.
Image Classification	Deep learning model built with TensorFlow and Keras.
Capstone Data Science Project	End-to-end project from raw data to a deployed web app.

7 Learning Outcomes

- Write Python and SQL for data analysis and modelling.
- Apply statistics and probability to real-world data.
- Clean, explore and visualize data effectively.
- Build and evaluate machine learning and deep learning models.
- Work with text and time series data.
- Deploy models and present insights to business stakeholders.

8 Career Opportunities

- Data Scientist
- Machine Learning Engineer
- Data Analyst
- AI Engineer
- Business Analyst
- Junior Data Scientist

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

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