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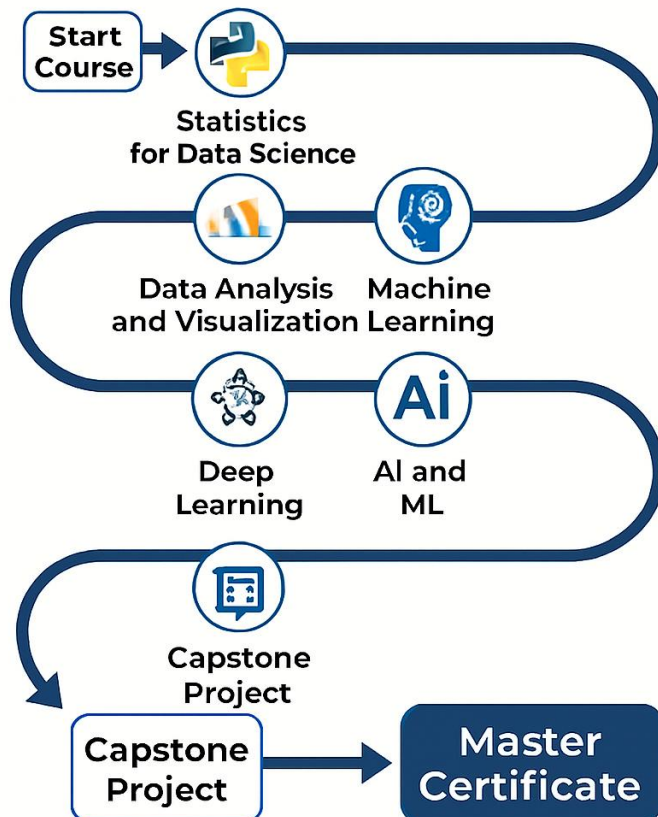
DATA SCIENCE

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Modules of Data Science

Start Course → Statistics for Data Science

Data Analysis and Visualization · Machine Learning

Deep Learning · AI and ML

Capstone Project

Capstone Project → **Master Certificate**

DATA ANALYTICS

Introduction to Data Analytics

- Introduction to Data Analytics

- Introduction to Data Science

- Applications and Impact in various industries

- Benefits of Data Analytics for Businesses.

Data Analytics With Excel

Basics for Excel

- Data Formatting

- Data Calculations

- Data Automation

- Sorting and Filtration

Excel Data Functions

- IF Functions

- COUNTIF, SUMIF

- VLOOKUP

Table And Dashboarding

- Pivot Tables

- Analysis using Pivot Table

- Charts

- Dashboarding

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Statistics For Data Analytics

All About Data

- Variables in Statistics
- Qualitative and Quantitative
- Population and Sampling
- Sampling Techniques

Descriptive Statistics

- Measure Of Central Tendency
- Measure of Dispersion
- Normal Distribution
- Skewness and Kurtosis

Statistics For Data Analytics

Inferential Statistic

- Hypothesis Testing
- Methods
- T-Test | Z-Test | Chi-Square Test
- ANOVA

Probabilities

- Probability basics
- Common probability distributions
- Sampling and the Central Limit Theorem

Python For Data Analytics – Basic

Basic Python

- Introduction to Python

- Syntax Understanding in Python

- Variables in python

- Operators in python

- Built-in keywords and Methods in Python

- Data Types in Python

- Data Structures in Python

Intermediate Python

- Flow Control Statements

- If Else Statements

- Loops

- Defining a Function

- Lambda, Map, Reduce, and Filter functions

Advanced Python

- Classes and Objects (OOPS)

- Inheritance in Python

- Handling and Exceptions

Exploratory Data Analytics (Eda)

Introduction to Exploratory Data Analytics

- What is EDA?

- Why do we need EDA?

- Libraries and Modules used for EDA

- Import and Export Data

- Getting Data from Web Sources

NUMPY

Numpy Introduction

- Introduction to NumPy and its importance in EDA

- Introduction to Arrays

- Numpy arrays: Creating, indexing, and slicing

File I/O with NumPy

- Reading and writing data from/to files

- Memory-mapped files

Data Manipulation with NumPy

- Introduction to NumPy and its importance in EDA

- Introduction to Arrays

- Numpy arrays: Creating, indexing, and slicing

Numerical Computations

- Basic statistical functions in NumPy

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- Linear algebra operations with NumPy

- Random number generation with NumPy

Performance Optimization Techniques

- Vectorization vs. Loops

- NumPy performance tips

- Optimization Tricks

Integration with other libraries

- Integration with Pandas

- Visualization with Matplotlib

- Visualization with Seaborn

- Visualization with Plotly

Pandas

Introduction

- Introduction to Pandas and its Role in EDA

- Series and DataFrame data structures

- Data indexing, selection, and filtering

- Basic operations on Series and data frames

Data Cleaning and Preprocessing

- Handling missing data in Pandas

- Data deduplication and data type conversion

- Merging and joining DataFrames

Pandas

Data Analysis with Pandas

- Descriptive statistics and data summarization

- Grouping and aggregation in Pandas

- Pivot tables with pandas

- Working with text data in Pandas

Advanced Data Analysis

- Advanced grouping Operations

- Time series decomposition

- Handling categorical data

- Exploratory Data Analysis (EDA) techniques

Data Visualization

Data Visualization with Matplotlib

- Introduction to data visualization and its importance in EDA

- Basic visualizations concepts (figure, axes, plots)

- Understanding line plots, scatter plots, and bar plots etc.

Basic Plotting with Matplotlib

- Introduction to Matplotlib

- Create Basic Plots

- Customization of Plots

- Plot's Formatting

- Adding Annotations

Creating Subplots and Multiple Plots

- Creating Subplots

- Adding multiple plots

- Grid and Complex Layouts

Understanding Seaborn Library

- Default Statistical Plots

- Line Plot, Scatter Plot, Bar Plot, Histograms, Box Plots, Violin Plots, Heatmaps etc.

- Customized Plots

- Categorical Data Plotting

- Dist Plots / Displots

- Kernel Distribution estimators plots (KDE)

- Regression Plots

DATABASE – MySQL

Introduction to Databases and SQL

- Customized Plots

- Categorical Data Plotting

- Dist Plots / Displots

- Kernel Distribution estimators plots (KDE)

- Regression Plots

Data Retrieval with SQL

- Customized Plots

- Categorical Data Plotting

- Dist Plots / Displots

- Kernel Distribution estimators plots (KDE)

- Regression Plots

Data Aggregation and Grouping

- Aggregating data using functions (SUM, AVG, COUNT, etc.)

- GROUP BY clause for data grouping

- HAVING clause for filtering grouped data

Data Joins and Relationships

- Understanding table relationships (foreign keys)

- INNER JOIN, LEFT JOIN, RIGHT JOIN

- Using subqueries for complex queries

Business Intelligence - Power BI

Introduction to Power BI and Data Sources

- Overview of Power BI and its components

- Installing Power BI Desktop

- Connecting to various data sources (Excel, databases, web data, etc.)

- Loading and transforming data in the Power Query Editor

Data Modeling in Power BI

- Introduction to data modeling concepts

- Creating relationships between tables

- DAX (Data Analysis EXpressions) basics

- Measures and calculated columns

Business Intelligence - Power BI

Data Visualization with Power BI

- Creating different types of visualizations (bar charts, line charts, pie charts, etc.)

- Customizing visual elements (colors, fonts, titles)

- Interactivity with slicers and filters

- Drill-through and drill-down

Power BI for Reports and Dashboards

- Building interactive reports and dashboards

- Layout and design considerations

- Publishing and sharing reports on the Power BI Service

Introduction to Tableau

- Importance of data visualization in analytics.

- Different versions of Tableau (Public, Desktop, Server, Online).

Connecting to Data

- Importing data from Excel, CSV, databases, and cloud sources.

- Understanding data types and data blending.

Building Basic Visualizations

- Creating bar charts, line graphs, and pie charts.

- Using filters, sorting, and grouping data.

Dashboards & Storytelling

- Combining multiple charts into a dashboard.

- Adding interactive elements like filters and parameters.

Basic Calculations & Functions

- Using calculated fields (SUM, AVG, IF statements).

- Understanding table calculations and aggregations.

Master Degree In Data Science

Foundations of Data Science

Introduction to Data Science

- Data Science vs. Data Analytics

- The data science workflow

- Tools and environments (Python, Jupyter)

- Concepts of Regression and Classification

Data Acquisition and Cleaning

- Data sources and collection

- Data cleaning and preprocessing

- Handling missing data

-

Machine Learning

Machine Learning Fundamentals

- Understanding machine learning
- Types of machine learning (supervised, unsupervised, reinforcement)
- Machine learning workflow

ASSESSMENT FOR LINEAR AND LOGISTIC REGRESSION

Machine Learning

Data Preprocessing for Machine Learning

- Data cleaning and transformation
- Data scaling and normalization
- Handling missing data

Supervised Learning Algorithms

Predictive Analytics Regression

- What is regression analysis?
- Types of regression (linear, multiple, polynomial, etc.)
- Use cases and applications of regression in data

Linear Regression

- Simple linear regression
- Multiple linear regression

- Assumptions of linear regression

- Model interpretation and coefficients

- Model evaluation metrics R-squared, MSE, MAE

Logistic Regression

- Introduction to logistic regression

- Logistic regression vs. linear regression

- Binary and multinomial logistic regression

- Odds ratio and log-odds interpretation

Model evaluation for classification

Decision Tree

- What is a decision tree? And How decision trees work.

- Decision Tree Splitting Criteria

- Dealing with categorical features.

- Advantages and Disadvantages of Using a Decision

Random Forest

- What is a Random Forest?

- The concept of bagging and boosting

- Random Forest Features and Hyperparameters

- Handling imbalanced Data

XGBoost (Extreme Gradient Boosting)

- Introduction to Gradient Boosting

- Understanding boosting and the concept of weak learners.

- How XGBoost improves upon traditional gradient boosting.

- XGBoost Hyperparameters.

Naive Bayes Algorithm

- Introduction to Naive Bayes

- Types of Naive Bayes

- Probability Distributions

- Training and Classification

SVM (Support Vector Machine)

- Introduction to Support Vector Machines

- Support Vector Classification SVC

- Support Vector Machines for Regression SVR

- Kernel Trick and Non-Linear SVM

Model Evaluation and Validation

- Cross-validation and train-test split

- Evaluation metrics (accuracy, precision, recall, F1-score)

- Bias-variance trade-off

Unsupervised Learning Algorithms

K-Means Algorithm

- Introduction to Clustering

- KMeans Algorithm

- Objective Function and Optimization

- Challenges and Limitations

K-Nearest Neighbors (K-NN)

- Introduction to KNN

- Distance Metrics

- Hyperparameter K

- Decision Boundary and Majority Voting

Deep Learning

- Introduction to Deep Learning and TensorFlow.

- Convolutional Neural Networks CNNs) with TensorFlow.

- Recurrent Neural Networks RNNs) and Sequence Models.

- Advanced Deep Learning with TensorFlow and Keras.

NLP (Natural Language Programming)

Introduction to NLP

- What is NLP?

- Applications of NLP

- History and evolution of NLP

- Challenges and limitations in NLP

Text Preprocessing

- Tokenization

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- Stop words removal

- Stemming and Lemmatization

- Text cleaning and normalization

Text Representation

- Bag of Words BoW

- Term Frequency-Inverse Document Frequency TFIDF

- Word embeddings Word2Vec, GloVe)

- Document-term matrices

Sentiment Analysis and Text Classification

- Sentiment analysis techniques

- Binary and multi-class classification

- Building a sentiment analysis model