Metailearn

DATA ANALYTICS

SYLLABUS & CONTENTS

Approved by American Board of Education

This course provides an introduction to the field of data science, covering the principles and techniques used for data analysis, data visualization, and machine learning. The course is designed for students with little or no prior experience in data science, and it will equip them with the foundational knowledge and practical skills required for data-driven decision making.

- Understand the principles of data science and its role in business and society

- Collect and clean data from various sources

- Analyze and visualize data using statistical methods and tools

- Build and evaluate predictive models using machine learning algorithms

- Communicate data-driven insights to stakeholders

Module 1: Python Basics

- Introduction to Python and installation
- Introducing Jupyter Notebook
- Variables in Python
- List, Set, Dictionary, Tuple
- Data types in Python
- Operators
- User input
- If, if else, if elif
- Loops: for, while
- Loop control statements: break, continue, pass
- Functions in Python
- Object-Oriented Programming(OOP)

Module 2: Python for Data Analytics

- Introduction to Python for Data Analytics
- Introduction to Data Analytics Libraries in Python :: numpy, pandas, matplotlib, seaborn
- Data Visualization - Basic Visualizations techniques

Module 3: Data Preprocessing

- Handling missing values
- Outlier detection
- Encoding
- Scaling & Normalization
- Correlation
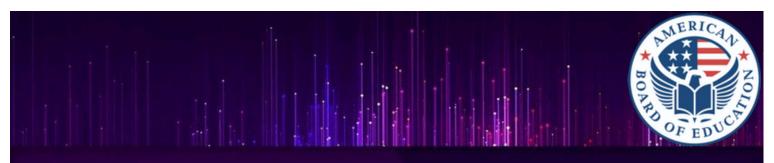
Module 4: Supervised Learning

- Introduction to Supervised Learning
- Regression
- Introduction to Classification, Logistic Regression, kNN
- SVM, Decision Tree, Random forest

Module 5: Feature Engineering

- Feature Engineering
- Model Selection and Tuning

Module 6: Unsupervised Learning

- Introduction to Unsupervised Learning
- Clustering, kMeans Clustering, Random Initialization Trap, Elbow Method
- Agglomerative Hierarchical Clustering, Dendrograms
- Dimensionality Reduction

Content

The content for this course will be delivered through a combination of lectures, hands-on exercises, and projects. The following tools and technologies will be used:
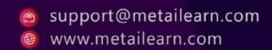
Python programming language
Jupyter Notebook
Pandas library for data manipulation
Matplotlib and Seaborn libraries for data visualization
Scikit-learn library for machine learning
Tableau for data visualization and reporting
The weekly assignments will include programming exercises, data analysis tasks, and short quizzes. The midterm exam will cover the topics covered in the first four weeks of the course. The final project will require students to apply the concepts and techniques learned in the course to a real-world data science problem. The class participation grade will be based on attendance, participation in class discussions, and group activities.

Assessment

Weekly Assignments (40%)

Midterm Exam (20%)

Final Project (30%)

Class Participation (10%)

100% Placement Support and Interview Grooming

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