R Programming

Course Modules & Topics

□ Module 1: Introduction to R

- What is R and why use it?
- Installing R and RStudio
- RStudio Interface Walkthrough
- Basic R Syntax & Commands

□ Module 2: Data Types and Structures

- Vectors, Matrices, Lists, Data Frames
- Factors and Categorical Data
- Indexing and Subsetting
- Type Coercion and Conversion

📊 Module 3: Data Manipulation with dplyr

- select(), filter(), arrange(), mutate(), summarise()
- Piping with %>%
- Grouping and Aggregating
- Joining Datasets

📈 Module 4: Data Visualization with ggplot2

- Grammar of Graphics Concept
- Creating Bar, Line, Histogram, Boxplots
- Customizing Themes and Colors
- Faceting and Plot Layers

🗂️ Module 5: Working with Data

- Reading and Writing CSV, Excel, and RDS files
- Importing Data from Web APIs
- Handling Missing Data
- Basic Data Cleaning Techniques

□ Module 6: Programming in R

- Writing Functions
- Control Structures (if-else, loops)
- Apply family (lapply, sapply, tapply)
- Error Handling and Debugging

📐 Module 7: Basic Statistics in R

- Descriptive Statistics
- Hypothesis Testing
- Correlation and Regression
- ANOVA

📊 Module 8: R for Data Science Projects

- Exploratory Data Analysis (EDA)
- Building a Data Pipeline
- Case Study: COVID-19 Data, Sales Data, or Customer Churn
- Presenting Findings with Plots and Reports

🚀 Module 9: Capstone Project

- Real-world dataset analysis
- Data cleaning, visualization, and summary
- Final Report and Presentation