Advanced Data Analysis Application Using the R Programming Language Training Course

Professional Development Training Course Outline

Category	Data Science	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In the ever-evolving field of data science and analytics, mastering **advanced data analysis** techniques is crucial for making informed, data-driven decisions. This **Advanced Data Analysis Application Using the R Programming Language** training course is designed for professionals who want to elevate their data analysis skills and dive deeper into the capabilities of **R programming**. Whether you're looking to analyze large datasets, apply statistical modeling, or generate predictive insights, this course equips participants with the skills necessary to execute sophisticated analyses with R. Strong keywords like **statistical analysis**, **data visualization**, **machine learning**, and **predictive modeling** will help you explore key topics that will enhance your analytical capabilities and ensure your data skills remain at the forefront of industry trends.

Through a hands-on approach, participants will work with **real-world datasets**, learning to perform tasks such as advanced statistical analysis, data manipulation, and visualization using **R**. The course will also explore integrating **machine learning algorithms**, building **predictive models**, and automating data analysis workflows. By the end of this training, participants will be able to confidently analyze and visualize complex data, uncover hidden trends, and provide actionable insights that drive business decisions. The course emphasizes **practical skills** and industry best practices, ensuring that participants leave with the confidence to apply their learning in any data-intensive role

Programme Curriculum

Advanced Data Analysis Application Using the R Programming Language Training Course

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Course Objectives

By the end of this course, participants will be able to:

1. Understand advanced statistical techniques for data analysis using R.
2. Manipulate and preprocess large datasets efficiently with R.
3. Use R libraries **for** data visualization, including ggplot2, plotly, and Shiny.
4. Apply machine learning algorithms in R for classification, regression, and clustering tasks.
5. Conduct hypothesis testing and interpret statistical results.
6. Build predictive models and evaluate their accuracy.
7. Implement time series analysis and forecasting techniques.
8. Integrate **R** with other tools like SQL, Python, and Hadoop for big data analysis.
9. Automate data cleaning and preprocessing workflows in R.
10. Understand the use of data wrangling techniques to prepare messy datasets for analysis.
11. Develop interactive dashboards and reports using R Shiny.
12. Utilize RMarkdown for reproducible research and dynamic report generation.
13. Create complex data visualizations that communicate insights effectively.

Target Audience

This course is ideal for:

1. Data Scientists
2. Data Analysts
3. Business Intelligence Analysts
4. Statisticians
5. Research Scientists
6. Academics and Educators
7. IT Professionals working with big data
8. Consultants seeking to implement data-driven solutions for clients

Course Content

Module 1: Introduction to Advanced Data Analysis in R

- Overview of R and RStudio
- Setting up the R environment
- Key R packages for data analysis
- Introduction to **tidyverse** and **dplyr** for data manipulation
- R scripting basics for reproducible analysis

Module 2: Data Preprocessing and Wrangling

- Data cleaning techniques in R
- Handling missing values and outliers
- Working with categorical and continuous variables
- Reshaping and transforming data using **tidyr** and **reshape2**
- Merging and joining datasets for complex analyses

Module 3: Statistical Analysis and Hypothesis Testing

- Understanding statistical tests and their assumptions
- Performing t-tests, ANOVA, and chi-squared tests
- Confidence intervals and effect sizes
- **Linear and non-linear regression analysis**
- Interpreting statistical output in R

Module 4: Advanced Data Visualization Techniques

- Principles of effective data visualization
- Creating advanced plots with **ggplot2**
- Customizing visualizations with **plotly** for interactive charts
- Building interactive dashboards using **Shiny**
- Data visualization best practices for storytelling

Module 5: Machine Learning Algorithms with R

- Introduction to machine learning in R
- Supervised vs unsupervised learning
- Implementing regression models and decision trees
- Classification algorithms: Random Forests, SVM, k-NN
- Evaluating model performance using **cross-validation** and **confusion matrices**

Module 6: Time Series Analysis and Forecasting

- Basics of time series data
- Decomposing time series for trend, seasonality, and noise
- Forecasting techniques using **ARIMA** and **exponential smoothing**
- Time series visualization with **ggplot2**
- Evaluating forecast accuracy using RMSE and MAPE

Module 7: Big Data Analysis and Integration with Other Tools

- Connecting R to **SQL databases** and **big data** platforms (e.g., Hadoop)
- Data manipulation with **sparklyr** for big data analytics
- Using **dplyr** and **data.table** for high-performance data processing
- Parallel processing techniques in R
- Handling and analyzing large datasets with R

Module 8: Reproducible Research and Reporting with R

- Introduction to **RMarkdown** for dynamic reports
- Integrating R code into documents for reproducibility
- Best practices for reporting statistical analysis
- Creating interactive visualizations with **Shiny**
- Version control for data analysis projects

Training Methodology

The training methodology integrates theoretical concepts with **hands-on exercises** and **real-world examples** to ensure participants can directly apply what they learn:

- **Expert-Led Sessions**: Engage with experienced instructors who provide in-depth explanations of advanced data analysis concepts.
- **Live Coding Demonstrations**: Watch live demonstrations and coding examples to understand the practical applications of the R programming language.
- **Interactive Labs**: Participate in practical exercises and case studies to reinforce the concepts learned.
- **Collaborative Learning**: Engage in group discussions and problem-solving activities to build your expertise.
- **Project-Based Learning**: Work on projects that involve real datasets, ensuring that you can apply the skills learned to solve practical data challenges.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com