

Public Finance Data Analytics with R and Python Training Course

Professional Development Training Course Outline

Category	Public Financial Management & Budgeting	Duration	5 Days
Base Fee	\$1,500 USD	Delivery Mode	Online / On-site Hybrid

Course Introduction

In today’s dynamic global economy, the ability to leverage data analytics in public finance is essential for effective policy-making, transparency, and fiscal accountability. Governments, Supreme Audit Institutions (SAIs), financial regulators, and development agencies are increasingly adopting data-driven decision-making to strengthen governance, enhance budget analysis, improve revenue forecasting, and combat inefficiencies in public financial management. By integrating advanced data science tools like R and Python, professionals can harness big data, machine learning, and predictive analytics to transform how public sector finance operates.

Public Finance Data Analytics with R and Python Training Course equips participants with cutting-edge analytical skills to process, analyze, visualize, and interpret public finance datasets using R programming and Python frameworks. Through practical case studies, participants will learn how to uncover hidden insights in fiscal data, develop predictive financial models, and implement evidence-based strategies for improved governance, accountability, and transparency. The course combines real-world applications with hands-on projects to build competence in applying data science techniques for public finance challenges.

Programme Curriculum

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Course Objectives

1. Apply data analytics in public financial management.
2. Develop budget forecasting models using R and Python.
3. Utilize machine learning for fiscal risk analysis.
4. Strengthen transparency and accountability through data visualization.
5. Conduct tax revenue analytics for policy evaluation.
6. Implement predictive modeling in expenditure management.
7. Leverage big data tools for public sector efficiency.
8. Apply time-series analysis for macroeconomic projections.
9. Integrate AI-driven financial dashboards for decision-making.
10. Enhance data governance and open data policies.
11. Analyze corruption risks using anomaly detection.
12. Apply statistical computing for evidence-based policymaking.
13. Strengthen capacity building in digital finance transformation.

Target Audience

1. Government financial analysts.
2. Public policy researchers.
3. Supreme Audit Institution officers.
4. Data scientists in finance ministries.
5. Economists and fiscal planners.
6. Development agency finance officers.
7. University researchers in economics & finance.
8. Anti-corruption and transparency advocates.

Course Duration: 5 days

Course Modules

Module 1: Introduction to Public Finance Data Analytics

- Fundamentals of public financial management (PFM).
- Overview of R and Python for finance.
- Key datasets in public finance.
- Importance of open data in governance.
- Hands-on session with fiscal data.
- *Case Study: IMF Open Budget Data Analytics.*

Module 2: Data Preparation and Cleaning with R and Python

- Importing and managing financial datasets.
- Data wrangling and preprocessing.
- Handling missing values and outliers.

- Building reproducible data pipelines.
- Exploratory data analysis (EDA).
- *Case Study: Cleaning World Bank Expenditure Data.*

Module 3: Data Visualization for Transparency and Accountability

- Visualization principles for fiscal data.
- Advanced charts in R (ggplot2) and Python (Matplotlib, Seaborn).
- Creating interactive dashboards (Shiny, Plotly).
- Communicating insights effectively.
- Building transparency dashboards for citizens.
- *Case Study: Kenya's Open Budget Portal.*

Module 4: Predictive Analytics in Budgeting and Expenditure

- Forecasting government expenditure.
- Time-series forecasting models (ARIMA, Prophet).
- Machine learning applications in finance.
- Risk prediction and expenditure optimization.
- Model validation and performance testing.
- *Case Study: Predictive Modeling of Health Budgets.*

Module 5: Tax Revenue Analytics with Machine Learning

- Tax revenue trends and forecasting.
- Regression and classification models.
- Identifying tax compliance patterns.
- Detecting anomalies in tax collections.
- Policy impact simulation with data models.
- *Case Study: Revenue Authority Data Analytics.*

Module 6: Financial Risk and Fraud Detection

- Identifying fiscal risks using data.
- Fraud detection algorithms in finance.
- Anomaly detection in expenditure.
- Predictive modeling for corruption risks.
- Using AI for risk assessment.
- *Case Study: Detecting Fraud in Procurement Data.*

Module 7: Big Data and Advanced Analytics in Governance

- Introduction to big data frameworks (Hadoop, Spark).
- Integrating open government data.
- Cloud-based analytics for fiscal management.
- Scaling data pipelines for large datasets.
- Leveraging AI for financial transformation.
- *Case Study: Big Data in National Treasury Systems.*

Module 8: Capstone Project – Evidence-Based Policy Development

- Integrating R and Python in policy modeling.
- Developing policy dashboards.
- Real-world public finance datasets analysis.
- Policy simulations with predictive analytics.
- Presenting findings to stakeholders.

- *Case Study: Evidence-Based Policymaking for Social Programs.*

Training Methodology

- Interactive lectures blending theory and practice.
- Hands-on coding exercises using R and Python.
- Real-world case studies drawn from international datasets.
- Group projects and capstone exercises to enhance teamwork.
- Guided discussions to foster peer learning.
- Expert-led demonstrations of financial data analytics tools.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.com 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
07 Sep 2026	11 Sep 2026	Online	\$1,100
14 Sep 2026	18 Sep 2026	Online	\$1,100
21 Sep 2026	25 Sep 2026	Online	\$1,100
28 Sep 2026	02 Oct 2026	Online	\$1,100

Start Date	End Date	Location	Price
05 Oct 2026	09 Oct 2026	Online	\$1,100
12 Oct 2026	16 Oct 2026	Online	\$1,100
19 Oct 2026	23 Oct 2026	Online	\$1,100
26 Oct 2026	30 Oct 2026	Online	\$1,100

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