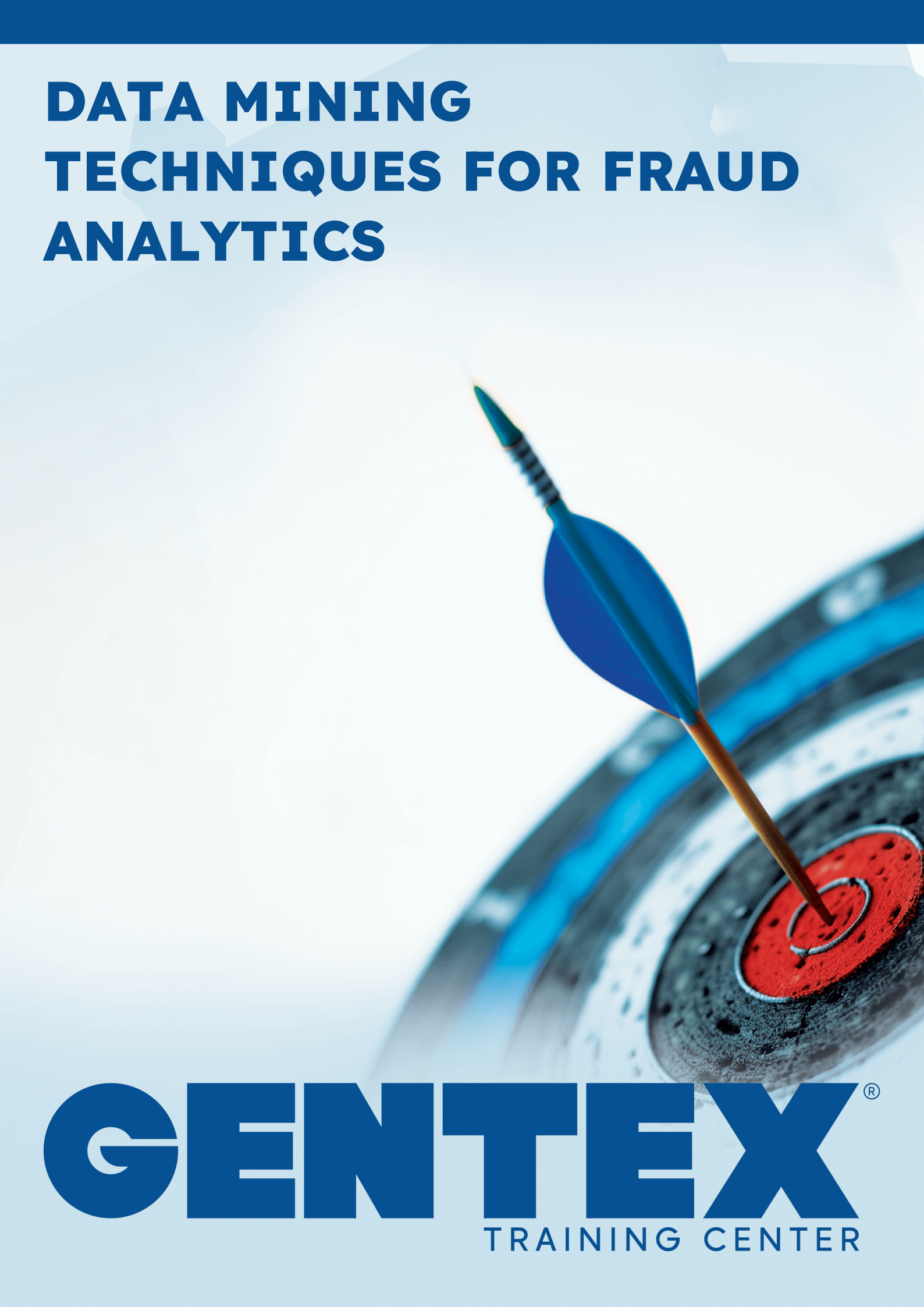
DATA MINING TECHNIQUES FOR FRAUD ANALYTICS



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Introduction

The Data Mining Techniques for Fraud Analytics Training Course prepares analysts and investigators to find fraud hidden inside large transaction datasets. Fraudsters leave traces, but those traces sit among millions of legitimate records that look similar. Data mining turns that volume into an advantage by surfacing patterns no manual review would notice. This course covers the core techniques analysts apply in fraud work. It covers association rules, clustering, anomaly detection, and predictive modelling. Furthermore, it applies social network analysis, text mining, and evidence documentation. As a result, participants convert raw data into defensible fraud findings.

Data Mining Techniques for Fraud Analytics Course Objectives

- Explain data mining concepts and the fraud analytics workflow.
- Prepare and clean transactional data for analysis and modelling.
- Apply descriptive statistics and profiling to detect deviations.
- Use Benford's Law and digit analysis to test for manipulation.
- Apply association rules and link analysis to uncover hidden relationships.
- Use clustering and outlier detection to identify suspicious segments.
- Apply classification and predictive models to fraud scoring.
- Conduct social network analysis on entities, accounts, and providers.
- Apply text mining to narratives, invoices, and communications.
- Document analytical findings to investigative and legal standards.

Course Methodology

- Interactive lectures with real fraud data and investigation case studies.

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- Data preparation and cleaning workshops using transaction datasets.
- Digit analysis, clustering, and outlier detection exercises.
- Network and text mining practice on fraud scenarios.
- Structured peer discussion with facilitator feedback on analytical findings.

Who Should Take This Course

- Fraud analysts and forensic data specialists.
- Internal auditors and investigation professionals.
- Compliance and financial crime analytics teams.
- Data analysts and business intelligence professionals.
- Risk managers covering fraud and misconduct risk.
- Loss prevention and security analytics staff.

Data Mining Techniques for Fraud Analytics Course Outlines

Day 1: Data Mining Foundations for Fraud Analysis

- Data mining concepts, methods, and the analytics workflow.
- Supervised, unsupervised, and descriptive analytics in fraud work.
- Data sources: ledgers, transactions, claims, and communications.
- Data quality issues, missing values, and duplicate records.
- Feature engineering for fraud indicators.
- Privacy, ethics, and data protection in fraud analytics.
- Case study: a data mining programme that exposed a fraud scheme.

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Day 2: Profiling and Digit Analysis

- Descriptive statistics and baseline profiling techniques.
- Deviation scoring and threshold setting.
- Benford's Law and digit frequency analysis.
- Relative size factor and duplicate payment detection tests.
- Trend, seasonality, and period comparison analysis.
- Sampling strategies for fraud testing.
- Workshop: running digit and duplicate payment tests on a ledger.

Day 3: Association, Clustering, and Outlier Detection

- Association rule mining and market basket analysis.
- Support, confidence, and lift interpretation.
- Link analysis for vendor, employee, and account relationships.
- Clustering methods including k-means and hierarchical clustering.
- Outlier and anomaly detection methods.
- False positive management and investigative triage.
- Workshop: clustering transactions to surface suspicious groups.

Day 4: Predictive Modelling and Network Analysis

- Classification models for fraud scoring and risk ranking.
- Decision trees, logistic regression, and ensemble methods.
- Model validation, precision, recall, and cost-based evaluation.
- Social network analysis and graph visualisation techniques.
- Collusion, circular transaction, and shell company detection.

- Combining rule-based and model-based detection.
- Workshop: building a fraud scoring model and link chart.

Day 5: Text Mining, Reporting, and Evidence

- Text mining and natural language processing for fraud documents.
- Keyword, sentiment, and inconsistency analysis.
- Optical character recognition for scanned evidence.
- Documenting analytical procedures and reproducibility.
- Preparing findings for investigation and legal proceedings.
- Presenting analytics to committees and law enforcement.
- Course review, assessment, and action planning.

Conclusion

By successfully completing Data Mining Techniques for Fraud Analytics, participants will gain a thorough understanding of data preparation, digit analysis, association and clustering methods, predictive modelling, network analysis, and text mining in fraud work. They will also acquire practical skills in data profiling, anomaly detection, fraud scoring, and evidence documentation. In addition, the course prepares them to produce analytical findings that withstand investigative and legal scrutiny. Gentex Training Center delivers this programme with a strong focus on applied analytics and measurable fraud detection improvement.

FAQs for Data Mining Techniques for Fraud Analytics course

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Q1 What is the "Data Mining Techniques for Fraud Analytics" course about?

It is a five-day programme on using data mining to detect fraud. It covers data preparation and profiling, Benford's Law and digit analysis, association rules and clustering, outlier detection, predictive fraud scoring, social network analysis, text mining, and analytical evidence documentation.

Q2 What are the key benefits of the "Data Mining Techniques for Fraud Analytics" course?

Participants learn to find fraud signals hidden in large datasets that manual review would miss. The course raises detection rates, reduces false positives and wasted investigation effort, strengthens evidence quality, improves fraud risk ranking, speeds up investigations, and supports findings that hold up in disciplinary and legal proceedings.

Q3 What skills will I gain from the "Data Mining Techniques for Fraud Analytics" course?

Participants gain transactional data preparation and profiling, digit analysis, association and clustering technique application, predictive fraud scoring and network analysis, and text mining with analytical evidence documentation. These four skills cover the analytical core of fraud detection work.

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Q4 What tools, methods, or standards are covered in the "Data Mining Techniques for Fraud Analytics" course?

The course covers supervised, unsupervised and descriptive analytics, feature engineering for fraud indicators, descriptive statistics and baseline profiling, deviation scoring and threshold setting, Benford's Law and digit frequency analysis, relative size factor tests, duplicate payment detection, trend and seasonality analysis, sampling strategies, association rule mining with support, confidence and lift, link analysis, k-means and hierarchical clustering, outlier and anomaly detection methods, decision trees, logistic regression and ensemble models, model validation with precision, recall and cost-based metrics, social network analysis and graph visualisation, collusion and circular transaction detection, text mining and natural language processing, keyword and sentiment analysis, optical character recognition, reproducibility documentation, and investigation and legal reporting standards.

Q5 How is the "Data Mining Techniques for Fraud Analytics" course applied in real-world practice?

Participants apply the techniques to real or simulated datasets. They clean and profile data, run digit and duplicate tests, cluster transactions, build fraud scoring models, draw link charts, mine documents for inconsistencies, and document findings for investigation. Many leave with reusable test scripts and a findings template ready for immediate use.

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