Probability and Statistics for Risk Professionals Training Course

Professional Development Training Course Outline

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

Course Introduction

In the contemporary landscape of interconnected global markets and rapidly evolving Enterprise Risk Management (ERM) frameworks, the ability to transition from qualitative assessment to Quantitative Risk Analysis is no longer a luxury it's a strategic imperative. Risk professionals face unprecedented challenges, from managing complex Systemic Risk interactions to navigating the uncertainties introduced by Geopolitical Volatility and Climate Risk exposure. Traditional risk modeling often relies on simplified assumptions that fail under real-world stress conditions, a critical deficiency exposed by recent financial and supply chain disruptions. Probability and Statistics for Risk Professionals Training Course addresses this gap by fortifying the core Stochastic and Inferential Statistics knowledge base, equipping participants with the rigorous, data-driven decision-making tools necessary to build truly resilient risk infrastructures.

This specialized training course is meticulously designed to move beyond theoretical concepts, focusing on the practical application of advanced probability and statistics in areas like Credit Risk, Operational Risk, and Market Risk. Participants will master techniques such as Monte Carlo Simulation, Bayesian Inference, and Time-Series Analysis to accurately model Fat-Tail Events and quantify Model Risk inherent in current systems. By translating complex data into actionable Risk Intelligence, attendees will gain the competence to not only meet stringent Regulatory Compliance but also to actively leverage Risk-Informed Strategy for competitive advantage. This program is your essential step toward becoming a High-Value Risk Leader capable of navigating and thriving in an environment of perpetual uncertainty.

Programme Curriculum

Probability and Statistics for Risk Professionals Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Apply Stochastic Processes to model asset price movements and event frequency in operational risk.
2. Master distributions beyond the Normal for accurately quantifying Extreme Event and Tail Risk.
3. Implement Multivariate Regression and Logistic Regression techniques to isolate and quantify key risk drivers across different business units.
4. Utilize Bayesian Statistics to update risk assessments in real-time by integrating expert judgment and new empirical evidence.
5. Execute and interpret Monte Carlo and Historical Simulation for dynamic Value-at-Risk (VaR) and Expected Shortfall (ES) calculations.
6. Apply ARIMA/GARCH models for volatility clustering and superior Financial Time-Series forecasting in market risk.
7. Quantify, manage, and report on Model Uncertainty and Calibration Risk as a core component of ERM.
8. Assess the impact of Data Bias and poor Data Quality on risk model outputs and ensure Data Integrity.
9. Use Copulas and Correlation Analysis to model dependency structures between seemingly disparate Systemic Risks.
10. Design robust, data-backed Stress Testing and Reverse Stress Testing scenarios tailored to regulatory requirements and internal risk appetite.
11. Understand the statistical principles underpinning basic Predictive Risk Analytics
12. Apply Compound Poisson Processes and loss distribution aggregation to quantify Operational Loss Exposure.
13. Translate statistical outputs into clear, concise inputs for Strategic Risk-Return Trade-offs.

Target Audience

1. Risk Analysts / Senior Risk Specialists
2. Chief Risk Officers (CROs) and Risk Managers seeking quantitative proficiency.

3. Quantitative Analysts in Front Office or Middle Office.
4. Internal and External Auditors focused on Model Validation and Regulatory Compliance.
5. Actuarial Professionals transitioning into Enterprise Risk Management
6. Treasury and Finance Professionals involved in Capital Allocation and Liquidity Risk.
7. Data Scientists and Machine Learning Engineers focused on Predictive Risk Analytics.
8. Project Managers overseeing large-scale, high-uncertainty projects

Course Modules

Module 1: Foundational Probability & Statistical Inference

- Revisit of Axioms, Conditional Probability, and Bayes' Theorem.
- Deep dive into common and specialized distributions
- Calculating probabilities for portfolio losses using marginal and joint distributions.
- Case Study: Credit Default Swaps Pricing
- Dependence Structure

Module 2: Advanced Random Variables & Expectation

- Moment Generating Functions, characteristic functions, and properties of expected values.
- Maximum Likelihood Estimation and Method of Moments for parameter fitting.
- Deriving and calculating higher moments to assess non-normality.
- Case Study: Insurance Premium Calculation.
- Loss Distribution Aggregation

Module 3: Quantitative Market Risk Modeling

- Value-at-Risk (VaR) and Expected Shortfall (ES), Historical and Parametric VaR.
- Implementation of the Delta-Normal approach and introduction to Extreme Value Theory
- Backtesting VaR models using regulatory tests
- Case Study: The 2008 Financial Crisis.
- Backtesting & Stress Testing

Module 4: Time-Series Analysis & Volatility Modeling

- Stationarity, Autoregressive (AR) and Moving Average (MA) models.
- ARCH/GARCH models for capturing volatility clustering and mean reversion.
- Forecasting volatility for short-term and long-term risk horizon planning.
- Case Study: FX Rate Forecasting.
- Volatility Clustering

Module 5: Monte Carlo Methods & Simulation

- Pseudo-random number generation, variance reduction techniques
- Simulating future portfolio values and calculating Path-Dependent Options risk.
- Building a full Monte Carlo Simulation model for capital adequacy requirements.
- Case Study: Operational Risk Capital Charge – Simulating a loss distribution using aggregated internal and external loss data via Monte Carlo for Basel compliance.
- Scenario Generation

Module 6: Credit Risk and Default Modeling

- Probability of Default (PD), Loss Given Default (LGD), and Exposure at Default
- Utilizing Copulas to model correlation in default events within a loan portfolio.
- Constructing a simple Credit Portfolio Model using a one-factor Gaussian Copula.
- Case Study: Collateralized Debt Obligations (CDOs).
- Tail Dependence

Module 7: Operational and Non-Financial Risk Quantification

- Loss Frequency and Loss Severity modeling, and the limitations of historical data.
- Applying Generalized Pareto Distribution for modeling large, rare operational losses.
- Integrating Expert Opinion and qualitative risk scores into a quantitative framework using Bayesian methods.
- Case Study: Cyber Risk Quantification.
- Cyber Risk Quantification

Module 8: Introduction to Risk Analytics and Model Governance

- Principles of Model Risk Management (MRM), validation, and documentation.
- Overview of basic supervised learning algorithms for classification tasks
- Developing a framework for Sensitivity Analysis and stress testing model assumptions.
- Case Study: AI/ML Model Risk.
- Model Risk Management

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

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
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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