Quantie Institute of Advance Studies

(A Private Limited Company)

"Learn like a quant, think like a trader,
build like an engineer"

$$dS = r\,S\,dt + \sigma\,S\,dW_t$$

$$dr_t = \kappa(\dot{r} - r_t)dt + \sigma\,dW_t$$

$$dX_t = -\kappa X_t\,dt + \sigma\,dW_t$$

$$S_t = S_0 \exp\left[\left(\mu - \frac{1}{2}\sigma^2\right)t + \sigma W_t\right]$$

$$\frac{\partial V}{\partial t} + \frac{1}{2}\sigma^2 S^2 \frac{\partial^2 V}{\partial S^2} + rS\frac{\partial V}{\partial S} = rV$$

1-year
Online
Certificate
Program

CERTIFICATE PROGRAM IN QUANTITATIVE FINANCE

Transform Your Career with
Advanced Quantitative Finance Training

Next Batch: **August 2026**

www.quantie.in

ABOUT QUANTIE

Quantie was established in early 2025 by Dr. Akhielesh Prrasad, an alumnus of IIT Kharagpur, with its registered address in Pune, India. The institute is dedicated to providing highly specialized, quant-driven education grounded in strong mathematical theory and real-world financial practice.

Quantie's flagship one-year online Certificate Program in Quantitative Finance is designed to bridge rigorous theoretical foundations with industry-relevant applications. The program places a strong emphasis on mathematical modeling, stochastic methods, and intensive Python-based implementation, supported through a blend of recorded content and live interactive sessions. The next batch of the program is scheduled to commence in **August 2026**.

WHO SHOULD APPLY

- **Fresh Graduates (Engineers, Statisticians, Physicists, and Mathematicians)**: Leverage your analytical strengths and programming skills to solve complex financial problems and transition into high-demand quantitative roles.
- **BBA/MBA Students & Investment Professionals**: Strengthen your quantitative and computational toolkit to stand out in competitive finance careers. Particularly valuable for CFA and FRM candidates seeking deeper mathematical and technical rigor.
- **Academicians & Researchers**: Engage with advanced quantitative methods in derivatives pricing, asset management, and financial modeling, combining theoretical depth with applied implementation.
- **Working Professionals**: Upgrade your skill set to enhance effectiveness across quantitative finance, risk management, trading, portfolio management, institutional investing, and related analytical and financial engineering roles..

WHAT MAKES THIS PROGRAM UNIQUE

- **Mathematical Depth and Theoretical Clarity:** Each topic is developed from first principles, ensuring a rigorous and intuitive understanding of quantitative finance.
- **Intensive Python Implementation:** All concepts are reinforced through hands-on Python coding, preparing participants for real-world quantitative roles.
- **Real-World Financial Modeling:** Practical problems drawn from industry scenarios faced by quants, risk managers, and derivatives traders.
- **Comprehensive Curriculum:** Covers the entire spectrum—from financial foundations to stochastic calculus, data science, and risk management—in a single integrated program.
- **Fully Online Delivery:** Live interactive online lectures conducted on weekends, supplemented with recorded sessions, notes, and slides.
- **Industry Exposure:** Multiple workshops conducted by experienced industry practitioners on important areas including model validation and usage of Generative AI and Quantum computing in the financial domain.
- **Industry Relevance:** Modern financial institutions require professionals who can combine rigorous mathematics, quantitative modeling, programming, and advanced AI to design, implement, and govern end-to-end financial systems—spanning pricing, risk, trading, portfolio management, and automation—while managing uncertainty arising not only from markets, but also from models, data, and increasingly complex operational workflows.

CAREER OUTCOMES

Risk Analyst, Model Validation Analyst, Quantitative Researcher, Financial Analyst, Quantitative Trader, ALM Risk Manager, Data Scientist, Portfolio Manager, and related quantitative roles.

FACULTY

Dr. Akhielesh Prrasad

- MSc (Financial Engineering), WorldQuant University, USA
- DBA (Quantitative Finance), SP Jain School of Global Management, Australia
- MBA (Finance), EDHEC Business School, France
- B.Tech (Hons.), IIT Kharagpur, India
- CQF, FRM, CFA Level II Passed, ERM Level I

The program is further enriched by participation from distinguished academic and industry experts, who contribute through guest lectures, workshops, and focused sessions.

COURSE CURRICULUM

Module 0: Primers

0.1 **Mathematics:** Linear Algebra, Differential and Integral Calculus, Differential Equations, Probability, and Statistics.

0.2 **Python:** Variables and Data Types, NumPy, Pandas, Matplotlib, File and Directory Handling, Object-Oriented Programming, Regular Expressions, and more.

Module 1: Data Science for Finance

1.1 **Time Series Analysis with Python:** OLS and its Mathematics, Statistical Tests, Weighted OLS, Normality Tests, AR, MA, ARIMA, Cointegration, VAR, ARCH/GARCH Models, EWMA Volatility, and Advanced Volatility Estimators (Parkinson, Garman–Klass, Rogers–Satchell, Yang–Zhang).

1.2 **Machine Learning:** Linear and Logistic Regression, Lasso, Ridge, Elastic Net, Decision Trees, SVM, Ensemble Methods, Imbalanced Classification, PCA, ICA, LDA, SOM, Clustering Algorithms, Feature Engineering, Hyperparameter Tuning, Cross-Validation, and Pipelines.

1.3 **Deep Learning:** Neural Networks, MLP, CNN, RNN, LSTM, GRU, Activation Functions, Optimizers, Model Tuning, and Transformer.

1.4 **Reinforcement Learning:** Foundations of reinforcement learning and Markov decision processes, value-based and policy-based methods, reinforcement learning for trading and portfolio rebalancing, execution and transaction cost optimization, risk-aware and constrained reinforcement learning, and evaluation of strategy robustness in non-stationary financial markets.

1.5 **Advanced AI and Agentic Systems:** Applications of LLMs and generative AI in quantitative research and decision support; agent-based architectures for automated trading, portfolio, and execution workflows; integration of AI with traditional quantitative models and market signals; analysis of uncertainty beyond market movements, including operational and workflow risk; and governance, validation, and control of AI-driven financial systems through real-world case studies.

Module 2: Optimization Methods in Finance

2.1 **Introduction to Optimization:** Linear and Non-Linear Optimization.

2.2 **Portfolio Optimization:** Markowitz Framework for 2 and more assets, Risk Metrics and Decomposition, Risk Parity, Hierarchical Risk Parity, Risk Budgeting, Drawdown-Based Optimization (ADD, MDD, DaR, CDaR), VaR and ES Optimization, Role of Component VaR and Marginal VaR, Monte Carlo Simulation, Black–Litterman Model.

Module 3: Derivatives and Stochastic Calculus

3.1 **Derivatives and Option Pricing:** Put–Call Parity, Option Strategies, Black–Scholes Model, Binomial and Trinomial Trees, Greeks, Implied Volatility, and Volatility Smile.

3.2 **Stochastic Calculus for Finance:** Brownian Motion, Kolmogorov Equation, Ito's Lemma, SDEs, Martingales, Black–Scholes Derivation, Girsanov Theorem, Radon–Nikodym Theorem, Feynman–Kac Formula, Interest Rate Models, and Stochastic Volatility Models.

Module 4: Stochastic Modeling and Numerical Methods

4.1 **Stochastic Modeling:** MLE, Calibration, Monte Carlo Simulation, Interest Rate and Volatility Models, Jump Diffusion Models, Simulation-Based Pricing.

4.2 **Numerical Methods:** Random Number Generation, Variance Reduction, Monte Carlo Pricing, Finite Difference Methods, Euler Discretization, Matrix Decompositions (Cholesky and LU).

Module 5: Financial Risk Management

5.1 **Market Risk Analysis:** VaR Methodologies, Expected Shortfall, Stress Testing, Liquidity Risk, Tail Risk, Basel and FRTB Frameworks, ALM.

5.2 **Credit Risk Analysis:** PD, LGD, EAD, CVA/DVA, Credit Derivatives, Stress Testing, Rating Methodologies.

Module 6: Fixed Income and Credit Derivatives

6.1 **Fixed Income Securities:** Bond Valuation, Duration and Convexity, Immunization, PCA/ICA Hedging, ALM, Yield Curve Strategies, Swaps, FRAs, Securitization, Callable and Puttable Bonds.

6.2 **Credit Derivatives:** Interest Rate Derivatives, Swaptions, Caps and Floors, CDS, Credit-Linked Notes, Variance Swaps.

Module 7: Trading Methodology

Technical Analysis and Quantitative Trading Strategies.

Module 8: Capstone Project

Participants will work in groups on either an assigned academic/industry project or a self-selected topic (subject to approval). The capstone integrates theoretical knowledge, quantitative modeling, and computational implementation, culminating in a structured report and presentation.

Note: The curriculum outlined above is indicative and presented in a concise form. The actual coverage of topics is substantially broader and deeper, including additional theoretical developments, practical extensions, and implementation-oriented discussions, in line with academic rigor and evolving industry practices.

COLLABORATION OPPORTUNITIES

- **University Collaboration:** Joint teaching programs, collaborative research initiatives, and curriculum development with academic institutions.
- **Industry Collaboration:** Corporate training programs and strategic partnerships with quantitative finance firms and financial institutions.

PROGRAM FEES

- Domestic Candidates: INR 1,99,995
- International Candidates: USD 5,010

Fee Concessions

- **Regional Concession:** 50% discount on the international fee for African nationals and candidates from the Indian subcontinent (Nepal, Bhutan, Bangladesh, Sri Lanka, Maldives and Pakistan).
- **Early enrollment discount:** 10% discount for enrollments completed on or before June 30, 2026.
- **Bulk enrollment discount:** An additional 5% discount for enrollments of five or more participants, and 10% discount for enrollments of ten or more participants.

For detailed and time-bound promotional offers, visit www.quantie.in.

ENROLLEMENT

Contact

- Mobile / WhatsApp: +91-7588223762
- Email: quantie.qf@gmail.com
- Website: www.quantie.in

APPLY

For enrollment, complete the application form available at www.quantie.in or scan the QR code below.

Our Approach to Enrollment: At Quantie, we believe in informed decision-making rather than persuasion. Prospective participants are encouraged to review the syllabus carefully. If you have any questions or require clarification, we will be glad to answer them. The decision to enroll rests entirely with you.

OTHER CERTIFICATIONS

In addition to the above offerings, we provide a **Certificate Program in Data Science**, designed to address the rapidly growing demand for expertise in analytics, machine learning, and artificial intelligence across industries. We also offer customized programs tailored to specific institutional and corporate requirements.

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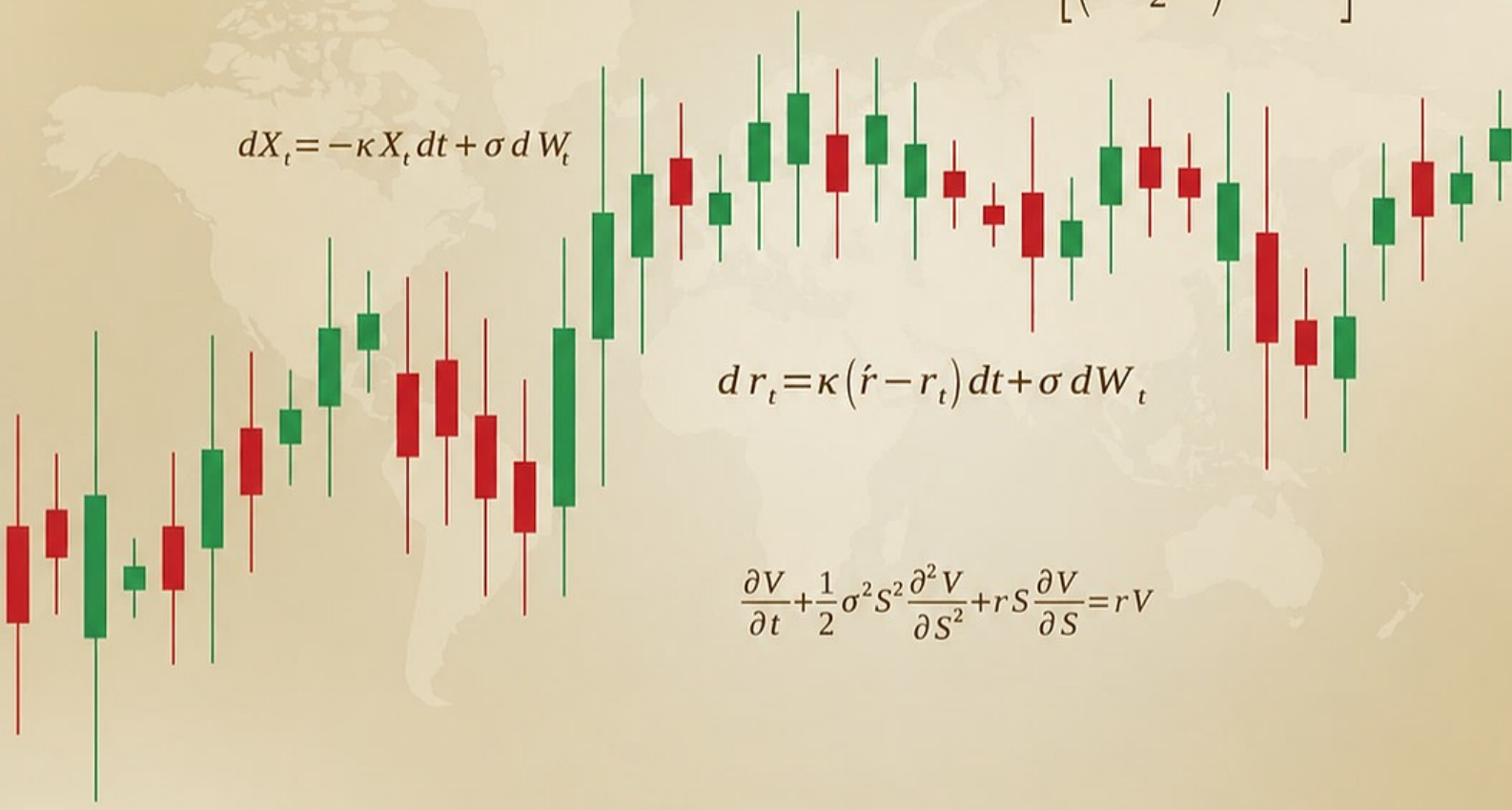

Quantie

CONTACT

+91-7588223672

quantie.qf@gmail.com

www.quantie.in

APPLY NOW

For enrollment, complete the application form available at **www.quantie.in** or scan the QR