FINANCIAL ENGINEERING FUNDAMENTALS



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Info@gentextraining.com

Introduction

Financial Engineering Fundamentals Training Course builds the technical foundation that finance professionals, treasury analysts, and risk officers need to structure, price, and manage financial instruments deliberately. Financial engineering applies mathematics, modelling, and market instruments to solve financing and risk problems. It answers questions such as: how should this exposure be hedged? What does this instrument really cost? What risk remains after structuring? Weak practice there produces mispriced hedges, hidden exposure, and instruments nobody fully understands. This course develops the discipline that prevents those outcomes. It covers time value, risk and return, derivatives, and structured solutions.

Financial Engineering Fundamentals Course Objectives

- Apply time value of money and discounting to instrument valuation.
- Explain risk and return concepts and portfolio theory fundamentals.
- Apply forward, futures, and swap pricing principles.
- Apply option pricing concepts and payoff construction.
- Apply the Black-Scholes framework and its core assumptions.
- Apply Greeks to measure and manage option risk.
- Apply interest rate and currency hedging structures.
- Apply securitisation and structured finance concepts.
- Apply no-arbitrage and replication logic to new structures.
- Apply risk measurement and valuation controls to engineered products.

Course Methodology

- Interactive lectures with real instrument and structuring cases.
- Pricing and payoff construction workshops.

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- Option, swap, and hedging exercises.
- Structured finance, validation, and control practice.
- Structured peer review with facilitator feedback on pricing work.

Who Should Take This Course

- Treasury and corporate finance professionals.
- Derivatives and structuring analysts.
- Risk managers and market risk officers.
- Investment banking and capital markets staff.
- Financial analysts and portfolio professionals.
- Consultants advising on financial structuring.

Financial Engineering Fundamentals Course Outlines

Day 1: Foundations of Valuation and Risk

- Time value of money, discounting, and compounding.
- Yield curves, spot rates, and forward rates.
- Risk and return concepts and expected return estimation.
- Volatility measurement and its role in pricing.
- Portfolio theory and diversification fundamentals.
- No-arbitrage principle and replication logic.
- Case study: valuing a cash flow stream from market data.

Day 2: Forwards, Futures, and Swaps

- Forward contracts and forward pricing principles.

- Futures contracts, margin, and marking to market.
- Cost of carry and convenience yield concepts.
- Interest rate swaps and swap pricing.
- Currency swaps and cross-currency basis.
- Credit default swaps and credit exposure basics.
- Workshop: pricing a forward and an interest rate swap.

Day 3: Options and Payoff Structures

- Option types, payoffs, and moneyness concepts.
- Put-call parity and arbitrage relationships.
- Binomial option pricing and tree construction.
- Black-Scholes model, assumptions, and inputs.
- Implied volatility and volatility smile concepts.
- Option strategies: spreads, straddles, and collars.
- Workshop: pricing options and constructing payoff diagrams.

Day 4: Risk Management with Derivatives

- Greeks: delta, gamma, vega, theta, and rho.
- Delta hedging and dynamic hedging practice.
- Interest rate risk hedging with swaps and caps.
- Currency exposure hedging structures.
- Commodity hedging and basis risk.
- Counterparty risk, collateral, and credit support annexes.
- Workshop: designing a hedging programme for identified exposures.

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Day 5: Structured Finance and Valuation Controls

- Securitisation structures and special purpose vehicles.
- Tranching, credit enhancement, and waterfall mechanics.
- Structured products and embedded derivatives.
- Valuation adjustments and model risk considerations.
- Independent price verification and valuation control.
- Documentation, governance, and regulatory reporting basics.
- Course review, assessment, and action planning.

Conclusion

By successfully completing Financial Engineering Fundamentals, participants will gain a thorough understanding of valuation and risk foundations, forwards, futures and swaps, options and payoff structures, risk management with derivatives, and structured finance and valuation controls. They will also acquire practical skills in time value and instrument valuation, forward, futures and swap pricing, option pricing and payoff construction, and derivative risk management, hedging and valuation control. In addition, the course prepares them to structure and price financial solutions with transparent assumptions and controlled risk. Gentex Training Center delivers this programme with a strong focus on applied financial engineering and defensible valuation practice.

FAQs for Financial Engineering Fundamentals course

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Q1 What is the "Financial Engineering Fundamentals" course about?

It is a five-day programme on applying mathematics and market instruments to financing and risk problems. It covers valuation and risk foundations, forwards, futures and swaps, options and payoff structures, risk management with derivatives, and structured finance and valuation controls.

Q2 What are the key benefits of the "Financial Engineering Fundamentals" course?

Participants structure and price financial solutions with understood exposure. The course improves valuation and yield curve work, sharpens forward, swap and option pricing, strengthens payoff and hedging design, improves Greeks-based risk measurement, and raises structured finance and valuation control quality.

Q3 What skills will I gain from the "Financial Engineering Fundamentals" course?

Participants gain time value and instrument valuation, forward, futures and swap pricing, option pricing and payoff construction, and derivative risk management, hedging and valuation control. These four skills cover the practical core of financial engineering work.

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Q4 What tools, methods, or standards are covered in the "Financial Engineering Fundamentals" course?

The course covers time value of money, discounting and compounding, yield curves, spot rates and forward rates, expected return estimation and volatility measurement, portfolio theory and diversification, the no-arbitrage principle and replication logic, forward contract pricing, futures margin and marking to market, cost of carry and convenience yield, interest rate swap pricing, currency swaps and cross-currency basis, credit default swaps, option payoffs and moneyness, put-call parity, binomial option pricing and tree construction, the Black-Scholes model and its assumptions, implied volatility and the volatility smile, option strategies including spreads, straddles and collars, the Greeks of delta, gamma, vega, theta and rho, delta and dynamic hedging, interest rate hedging with swaps and caps, currency and commodity hedging with basis risk, counterparty risk, collateral and credit support annexes, securitisation structures and special purpose vehicles, tranching, credit enhancement and waterfall mechanics, structured products and embedded derivatives, valuation adjustments and model risk, and independent price verification and valuation control.

Q5 How is the "Financial Engineering Fundamentals" course applied in real-world practice?

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Participants apply the methods to real and simulated instruments. They build yield curves and discount cash flows, estimate expected returns and volatility, price forwards and swaps from market data, construct binomial trees and apply Black-Scholes, calculate Greeks and run delta hedging, design option strategies such as spreads and collars, structure interest rate, currency and commodity hedges with basis risk assessment, analyse securitisation tranches and waterfalls, apply valuation adjustments, and perform independent price verification and valuation control checks. Many leave with a pricing and valuation workbook, a payoff construction template, and a hedging design and control framework ready to use.