
Options

Overview

This course provides a comprehensive and detailed analysis of options looking at pricing, risk characteristics, and their dynamic behavior in the context of the management of a portfolio of options

Learning Outcome Statements

- Comprehensive and practical analysis of options – pricing, risk characteristics and risk management.
- Practical focus on the varied applications of options in corporate exposure management, portfolio hedging and tactical asset allocation, trading and investment applications, and in the engineering of structured products
- Evaluate options from a number of different perspectives
- Gain understanding of the many strategies in which options are used to efficiently manage risk.
- Learn about the main asset classes – FX, equity, rates and commodities – variance swaps and listed volatility futures.

Key Contents

- Option valuation – principles and option pricing models
 - Fundamental concepts and properties of options
 - Continuous stochastic processes; Brownian motion
 - Analytical models: The Black-Scholes option pricing framework
 - Underlying concepts, assumptions and derivation of the Black-Scholes pricing model
 - Advantages and shortcomings of the Black-Scholes framework
 - Numerical methods: Binomial and trinomial lattice models
 - Valuing American and other path dependent options
 - Monte Carlo simulation
- Volatility
 - Understanding volatility; the role of volatility in option pricing
 - Volatility as an 'asset class'
 - Historic, implied and realised volatility measures
 - Volatility surfaces
 - Rationalising and interpreting volatility surfaces
 - Volatility analysis

- Local volatility models
- Stochastic volatility modeling
- Option risks; hedging and risk management of option positions
- Option strategies – hedging and risk management
 - Risk reduction strategies with options
 - Using options in corporate FX, rates and commodity risk exposure management
 - Option based hedging strategies in portfolio management
 - Simple hedging strategies
 - Structuring tailored hedges with options
 - Rationale for using non-linear (options) vs. linear hedges
- Option strategies – trading, investment and arbitrage strategies
 - Overview of trading applications of options
 - Distinguishing vega from gamma trading strategies
 - Higher order volatility trading strategies
 - Limited vs. unlimited risk strategies
 - Put-Call parity and arbitrage strategies
 - Directional trading: vertical spreads
 - Call and Put (Bull and Bear) spreads
 - Trading rationale
 - Pricing; impact of skew
 - Risk characteristics
 - Delta hedging
 - Gamma
 - Skew risk
 - Straddles and strangles
 - Structure and rationale
 - Risk characteristics
 - Vega and gamma trading
 - Skew and smile effects
 - Dynamic risk management
 - Risk reversals
 - Butterflies
 - Yield enhancement strategies
 - Dispersion trading
- Embedded option strategies
 - Embedding options into structured products
 - Long and short volatility structured products
 - Yield enhancement structured products
 - Capital guaranteed notes Interest rate options
 - Generic European style interest rate caps and floors
 - Conventional pricing methods: Black (1976) model
 - Why do markets use this model? Advantages and disadvantages
 - Calibration to a volatility surface
 - Pricing and hedging caps and floors
 - Stochastic term structure models (BDT, LIBOR market model)
 - SABR model
 - Delta hedging caps and floors
 - Gamma and vega management; risk bucketing
 - Practical applications
 - Asset and liability risk management
 - Embedded caps and floors; capped FRNs, minimax FRNs
 - Swaptions

- Equity options
 - European and American styles
 - Single stock and index options
 - Incorporating dividend assumptions into pricing models
 - Correlation dependency of basket and index options
 - Analysing relative value of index options: Implied vs. realised correlation patterns
 - Monetizing implied vs. realised correlation discrepancies: dispersion trading
 - Practical implementation of dispersion trading strategies
- Commodity options
 - Pricing of commodity derivatives
 - Pricing models for commodities
 - Commodity linked structured products
- Barrier options
 - Numerical (tree) methods of barrier option pricing
 - Pricing double barrier options and other variants
 - Impact of varying barrier parameters on performance, cost
 - Pricing using volatility surface
 - Hedging barrier options
- Path dependent options - average rate options
 - AROs (Average Rate Options) and ASOs (Average Strike Options)
 - Mechanics of average rate options
 - Geometric vs. arithmetic averages
 - Pricing of the Asian options
 - Hedging Asian options
 - Practical applications of Asian options
- Path dependent options - lookback, cliquet and reverse cliquet options
 - Definitions
 - Pay-off types:
 - Fixed and floating strike
 - Discrete and continuous sampling of maximum/minimum
 - Pricing and valuation issues
 - Numerical (tree) methods
 - Motivations for use – applications and examples
- Multi-asset options
 - Basket options
 - Spread options
 - Outperformance, 'Best of' and 'Worst of' option styles
 - Pricing methodologies
 - Hedging and risk management of multi-asset options
 - Uses and applications of multi-asset options
- Quanto options
 - Pricing quanto options
 - Hedging quanto derivatives
 - Applications of quanto options