Certificate in Derivatives

Syllabus

Module 1: Financial Markets and the Derivatives Ecosystem

- Structure of the capital market: primary and secondary markets.
- Market participants: investors, traders, hedgers, arbitrageurs, market makers and intermediaries.
- Stock exchanges, clearing corporations and depositories.
- Equity indices: construction, methodology and uses.
- ETFs, depository receipts and other exchange-traded products.
- India's derivatives market: equity, currency, interest rate and commodity segments.
- Derivatives at GIFT City (IFSC) and global derivatives exchanges.

Module 2: Introduction to Derivatives

- What derivatives are and why they exist.
- Forwards, futures, options and swaps.
- Exchange-traded versus over-the-counter (OTC) derivatives.
- Uses of derivatives: hedging, speculation, arbitrage and portfolio construction.
- Leverage and its consequences.
- Linear and non-linear payoffs.
- Benefits and risks of derivatives for the financial system.

Module 3: Understanding Underlying Markets

- Equity markets and corporate actions.
- Interest rate and bond markets.
- Foreign exchange markets.
- Commodity markets: agricultural, energy and metals.
- Supply and demand fundamentals across asset classes.
- Macroeconomic drivers: inflation, interest rates, growth and global capital flows.
- Liquidity, volatility and price discovery.

Module 4: Forwards and Futures: Pricing and Applications

- Forward contracts: features, uses and counterparty risk.
- Futures contracts: standardisation, contract specifications and expiry.
- Cost-of-carry model and fair value of futures.
- Basis, convergence, contango and backwardation.
- Index futures and single-stock futures.
- Pricing futures on dividend-paying assets, currencies and commodities.
- Rollover and calendar spreads.

Module 5: Trading Mechanics, Margins and Clearing

- Order types and trading systems.
- Clearing, settlement and novation.
- Initial margin, exposure margin and risk-based margining (SPAN).
- Mark-to-market settlement and margin calls.
- Physical settlement of stock derivatives.
- Position limits and market-wide position limits.
- Core settlement guarantee funds and default management.
- Transaction costs and their impact on returns.

Module 6: Hedging and Arbitrage with Futures

- Principles of hedging: long and short hedges.
- Hedge ratio and minimum variance hedging.
- Beta-adjusted hedging of equity portfolios.
- Cross hedging and basis risk.
- Cash-and-carry and reverse cash-and-carry arbitrage.
- Index arbitrage and calendar spread strategies.
- Evaluating hedge effectiveness.

Module 7: Options Fundamentals

- Call and put options: rights and obligations of buyers and sellers.
- Moneyness: in-the-money, at-the-money and out-of-the-money.
- Intrinsic value and time value.
- Payoff and profit diagrams.

- European and American options.
- Put-call parity.
- Index options and stock options.
- Exercise, assignment and settlement.

Module 8: Option Pricing and Volatility

- Factors that determine option prices.
- The binomial option pricing model.
- The Black–Scholes–Merton model.
- Black-76 model for futures options.
- Historical and implied volatility.
- Volatility smile, skew and term structure.
- Volatility indices, including India VIX.
- Limitations of option pricing models.

Module 9: The Option Greeks and Risk Management

- Delta, gamma, theta, vega and rho.
- Interpreting the Greeks for individual options and portfolios.
- Delta hedging and dynamic hedging.
- Gamma and vega risk.
- Time decay and its effect on option buyers and sellers.
- Scenario analysis and stress testing of option positions.
- Managing the risk of option-selling strategies.

Module 10: Option Strategies

- Covered calls and protective puts.
- Collars and portfolio insurance.
- Bull and bear spreads.
- Straddles and strangles.
- Butterflies and condors.
- Ratio spreads and calendar spreads.
- Selecting a strategy based on views on direction, volatility and time.
- Risk-reward, breakeven and margin analysis of strategies.

Module 11: Interest Rate Derivatives and Swaps

- Forward rate agreements (FRAs).
- Interest rate futures.
- Interest rate swaps: structure, pricing and valuation.
- Overnight indexed swaps (OIS) and benchmark rates.
- Caps, floors, collars and swaptions.
- Use of interest rate derivatives by banks, corporates and investors.
- Asset-liability management with derivatives.

Module 12: Currency and Commodity Derivatives

- Currency forwards, futures, options and swaps.
- Exchange-traded currency derivatives in India.
- Corporate foreign exchange hedging and RBI's framework for hedging.
- Commodity futures and options on Indian exchanges.
- Hedging by producers, processors and consumers of commodities.
- Delivery, quality and warehousing in commodity markets.
- Global commodity benchmarks.

Module 13: Credit Derivatives, Structured Products and Exotic Options

- Credit default swaps (CDS) and credit-linked notes.
- Structured products and market-linked debentures.
- Capital-protected and participation products.
- Barrier, digital, Asian and lookback options.
- Volatility and variance products.
- Product construction using derivatives.
- Suitability and risks of complex products.

Module 14: Regulation, Taxation and Investor Protection

- SEBI framework for equity derivatives, including measures to strengthen the derivatives market.
- RBI regulation of OTC, interest rate and currency derivatives.
- Regulation of commodity derivatives.
- IFSCA framework for derivatives at GIFT City.
- SEBI studies on the profitability of individual derivatives traders.
- Suitability, appropriateness and risk disclosures.
- Market abuse, insider trading and front-running.

- Taxation of derivatives income in India.
- Accounting for derivatives and hedge accounting under Ind AS 109.

Module 15: Risk Management and Behaviour

- Market, credit, liquidity and operational risk in derivatives.
- Value at risk (VaR) and expected shortfall.
- Position sizing and capital allocation.
- Leverage, drawdowns and risk of ruin.
- Behavioural biases in trading: overconfidence, loss aversion and the disposition effect.
- Building a disciplined trading and hedging process.
- Lessons from major derivatives losses: Barings, LTCM and Archegos.

Module 16: Case Studies in Derivatives

- Hedging an equity portfolio with index futures and puts.
- A corporate hedging import and export exposure.
- A bank managing interest rate risk with swaps.
- A commodity producer hedging price risk.
- Constructing and evaluating an option strategy around an event.
- Designing a structured product for an investor.

Recommended Reading

- John C. Hull, Options, Futures, and Other Derivatives.
- Sheldon Natenberg, Option Volatility and Pricing.
- Lawrence G. McMillan, Options as a Strategic Investment.