

Financial Modeling & Algo Trading : 150 hrs.

Module1: Introduction to Excel, Financial Modeling and Spreadsheet Essentials (15hrs)

- Introduction to Financial Modeling
 - Strengths and weaknesses of spreadsheets
 - Golden rules of spreadsheet design
 - Do we make the most of modeling?
- Spreadsheet essentials
 - Lookup and reference functions
 - NPV and IRR functions
 - Data tables
 - IF function
 - Excel Skills - Shortcuts, Formulas, Array Function and Pivot Tables
 - VBA
 - Macros
 - Simple exercise/models in excel

Module 2: Integrated financial modeling (Financial statement analysis) (20hrs)

- Equity Modeling - Equity Infusion
- Modeling Paid Up Capital and Share Premium Account
- Modeling Retained Earning Schedule
- Modeling the projected P/L and BS
- Modeling the projected Cash Flow Statement
- Conducting Covenant Testing
- Performing Ratio Analysis
- WACC and Cost of Equity Analysis
- Performing Valuation using DCF (FCFF & Enterprise Value) and Comparable analysis (Relative Valuation)
- Performing sensitivity/scenario analysis

Case study 1

Case study 2

Case study 3

Module 3a: Risk Analysis (10hrs)

- Estimating betas with regression analysis

- Using daily, weekly, and monthly data
- Testing market efficiency
 - With regression analysis
 - With pivot tables
 - Recording and editing macros

Module 3 b: Advanced risk analysis (10hrs)

- **Sensitivity, Scenario**
- Monte-Carlo simulation
- Risk analysis of discounted cash flow models
- Spreadsheet features
 - Using @Risk for Monte-Carlo simulation
 - Combining macros with @Risk

Case study 1

Case study 2

Case study 3

Module 4: Portfolio Optimization (15 hrs)

- Mean-variance portfolio selection
 - Computing mean-variance portfolios
 - Back-testing portfolio performance
 - Research on portfolio selection
- Bond portfolio selection
- Capital budgeting
- Spreadsheet features
 - Matrix operations in Excel
 - Using Solver for optimization
- Using macros to generate the efficient frontier

Module 5: Derivatives (30 hrs)

- Introduction
 - Intro to Derivatives
 - Futures Contract, Terminology, Mechanism & Pricing
 - Applications of futures contracts
 - Basis risk, why hedge?
 - Types, positions, spreads, margins, markets, underlying assets, options on futures
 - Factors affecting option prices, upper bounds, lower bounds, put & call parity.
 - Spreads, combinations, payoffs

- Black-Scholes formula
 - Pricing European options
 - Estimating implied stock return volatilities
- Application of Options contract
- Trading of Derivatives Contracts
- F & O Market Instruments: Individual & Index based
- Clearing & Settlement: Entities, Mechanism, Settlement Procedure
- Risk Management

Module 6 (Strategies): Practical Training (50hrs)

1. Conversion & Reversion
2. Future to Future
3. Cash to Future
4. Box, Butterfly, Straddle, Strangle
5. Condor, Ladder
6. Ratio
7. Bull/Bear Spread
8. Calender Spread
9. Covered Call

10. Covered Put

