

**College of Engineering Pune**  
**(An Autonomous Institute of Government of Maharashtra)**  
**Department of Mathematics**

**( MA ( MI )- ) Financial Derivatives and Structuring**

Minor Certification in Mathematics with specialization in 'Quantitative Finance' (Semester VI)

Teaching Scheme  
Lectures: 3 hrs / week

Examination Scheme  
Internal Test 1: 20 marks  
Internal Test 2: 20 marks  
End Sem. Exam: 60 marks

**Course Description:** Financial products are classified into simple products and derivative products. Derivatives are the ones where the instrument has a non-linear behavior, which is nothing but a combination of a variety of if-then-else conditions, which decide the path the product leads to and the returns it generates.

**UNIT I :** Asset Classes, Types of Options, Vanilla Options, First generation exotics, Second generation exotics, Payoffs, Digital Option, Option Strategies and Payoffs - Protected Put, Covered Call, Straddle, Strangle, Strip, Strap, Butterfly. **[10 Hrs]**

**UNIT II :** Futures and FRA, IRS and Other Swaps, Types of Kick-In and Knock-Out, Autocall, Coupon, FX Cash, FX Forward, Swap, Time Options, Futures vs Forwards, Interest Rate Swaps, Bid-Ask Spread, Accumulators and TRF, Zero Cost Product, Multi Leg Products. **[10 Hrs]**

**UNIT III :** Autocallable Notes, Structured Products - ELI, ELN, FCN, DRA, Phoenix, BEN, IR and Credit Linked Notes, Solvers and Greeks. **[10 Hrs]**

**UNIT IV :** Post Trade Life Cycle, Fixing Barrier, Amendment, Rollovers, Restate, Termsheet, PTDC, Fixing-Settlement Schedule, Mark to Market, MTM Accounting, MTM Losses during crises, Lombarding (Margin-Call). **[10 Hrs]**

**Text Book :**

“Options, Futures and Other Derivatives” – John C. Hull, Sankarshan Basu (Pearson Publication Latest Edition)

**Reference Book :**

“FX options and structured products” – Uwe Wystup (Wiley Finance)

**Course Outcomes :**

1. define Call and Put options and recognize Option Strategies that can be formulated.
2. identify Futures, Forwards, Swaps and other financial derivatives.
3. discover complex derivatives - Autocallables, CLNs.
4. interpret Greeks for complex derivatives.
5. trace the Post Trade Life Cycle for each payoff and learn the concept of Mark to Market.