Our 2-day workshop is designed to deliver a comprehensive understanding of models for VaR computation and model validation techniques, and measure the performance of market risk assessment techniques. Participants will learn about key components of market risk management, comparisons of current mathematical frameworks, and the impact of various regulations on market risk assessment.

### COVERAGE

#### DAY - 1

**MODULE 1: INTRODUCTION**

**30 MINUTES**

<table>
<thead>
<tr>
<th>Risk Management Mistakes &amp; How To Avoid Them</th>
</tr>
</thead>
<tbody>
<tr>
<td>→ Big Losses – Allied Irish Bank, Barings, LTCM etc</td>
</tr>
<tr>
<td>→ Risk Limits</td>
</tr>
<tr>
<td>→ Managing the Trading Room</td>
</tr>
<tr>
<td>→ Liquidity Risk</td>
</tr>
<tr>
<td>→ Lessons for Non-Financial Corporations</td>
</tr>
</tbody>
</table>

**Financial Institutions & Their Trading**

| → Commercial Banking |
| → Capital Requirements of a Small Commercial Bank |
| → Capital Adequacy: Practice Question (1) – PQ (1) |
| → Deposit Insurance |
| → Securities Trading |
| → Potential Conflicts of Interest in Banking |
| → Today’s Large Banks: |
| → Accounting |
| → The Originate-to-Distribute Model |
| → The Risks Facing Banks |

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**MODULE 2: HOW TRADERS MANAGE THEIR RISKS**

**2.5 HOURS**

| → Delta: Linear Products: Caselet/Nonlinear Products: PQ (1) |
| → Gamma: Making a Portfolio Gamma Neutral: PQ (2) |
| → Vega: PQ (3) |
| → Theta: Excel Spreadsheet: Delta, Gamma & Theta: PQ (4) |
| → Calculating Greeks using DerivaGem software: PQ (5) |
| → Taylor Series Expansion: PQ (6) |
| → The Realities of Hedging: Dynamic Hedging in Practice |
| → Scenario Analysis: Illustration |

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MODULE 3: INTEREST RATE RISK  2.5 HOURS

- Management of Net Interest Income: Illustration (1)
- Types of Rates: Treasury, LIBOR/Swap, LIBOR vs Treasury, OIS, Repo
- Duration: PQ (1) & PQ (2)
  - Modified Duration: PQ (3)
  - Dollar Duration
- Convexity: PQ (4)
  - Dollar Convexity
- Generalization: Portfolio Immunization
- Nonparallel Yield Curve Shifts: Partial Duration: Illustration (2)
- Interest rate Delta’s in Practice: Illustration (3)
- Principal Component Analysis to calculate Delta’s: Excel Spreadsheet

MODULE 4: VOLATILITY  1 HOUR

- Definition of Volatility: PQ (1) & PQ (2)
- Implied Volatilities – VIX Index
- Are Daily Percentage Changes in Financial Variables Normal: Caselet
- Monitoring Daily Volatility: Excel Spreadsheet
- The Exponentially Weighted Moving Average Model (EWMA): PQ (3)
- The GARCH (1,1) Model: PQ(4): Excel Spreadsheet

MODULE 5: CORRELATIONS  30 MINUTES

- What is Correlation?
- Correlation vs Dependence
- Monitoring Correlation
  - EWMA: PQ (1)
  - GARCH: PQ (2)
MODULE 6: VALUE AT RISK AND EXPECTED SHORTFALL 3 HOURS

- Definition of VAR – Historical Perspective
- Calculation of VAR: PQ (1) and PQ (2)
- Drawback of VAR
- Expected Shortfall
- Coherent Risk Measures:
  - Monotonicity
  - Translation Invariance
  - Homogeneity
  - Subadditivity
- Incoherence of VAR: PQ (3) & PQ (4)
- Coherence of ES: PQ (5) & PQ (6)
- Choice of Parameters for VAR and ES: PQ (7) & PQ (8)
  - Time Horizon
  - Impact of Autocorrelation: PQ (9)
  - Confidence Level: PQ (10)
- Marginal, Incremental, and Component Measures
- Euler’s Theorem
- Aggregating VARs and ESS: PQ (11)
- Back-Testing: PQ (12), PQ (13) & PQ (14)

MODULE 7: HISTORICAL SIMULATION 3 HOURS

- Methodology
  - VAR: Excel Spreadsheet
  - ES
  - Stressed VAR and Stressed ES
- Accuracy of VAR: PQ (1)
- Extensions: Excel Spreadsheets
  - Weighting of Observations
  - Including Volatility of Market Variables
  - Simpler Approach to Adjust for Volatility Changes

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## MODULE 8: MODEL-BUILDING APPROACH

- Basic Methodology: PQ (1)
- Two-Asset Case: PQ (2)
- Diversification Benefits: PQ (3)
- Generalization: PQ (4)
- Correlation and Covariance Matrices
  - PQ (5): Excel spreadsheet
  - Use of EWMA: Excel Spreadsheet
- Handling Interest Rates
  - Cash Flow Mapping: PQ (6)
  - Principal Component Analysis: PQ (7)
- Applications of the Linear Model
- Linear Model & Options: PQ (8) & Excel Spreadsheet
  - Weakness of Model
- Quadratic Model: Illustration
- Monte Carlo Simulation
- Non-Normal Assumptions
- Model Building vs Historical Simulation

## MODULE 9: REGULATORY IMPACT

### Basel I, Basel II, and Solvency II
- The G-30 Policy Recommendations
- The 1996 Amendment
- Back-Testing
- Basel II
  - Pillar 1: Minimum Capital Requirements
  - Pillar 2: Supervisory Review
  - Pillar 3: Market Discipline
- Solvency II

### Basel II.5, Basel III, Dodd-Frank Act & the FRTB
- Basel II.5:
  - Stressed VAR
  - Incremental Risk Charge
- Basel III:
  - Liquidity Risk: PQ (1)
- Dodd-Frank Act
- The Fundamental Review of the Trading Book (FRTB):
  - New Market Risk Measures
  - Trading Book vs Banking Book
  - Credit Trades
  - Excel Spreadsheet

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