

# **Credit Risk Modeling in the Era of Big Data Using Data Mining and Statistical Procedures: Methodology & Applications**

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# About this Course

This business-focused course will help students to understand the fundamentals of credit risk modeling and gain knowledge of industry best-practices for credit risk management and regulatory compliance. In addition, this course will demonstrate, through a series of hands-on exercises, how students can develop quantitative credit risk models using statistical procedures and data mining. This course will approach credit risk from the point of view of banks and will focus on the real-life applications of credit scoring as well as expected credit loss and capital requirements assessment.

## **WHO SHOULD ENROL**

This course is designed for students who are graduating with a degree or diploma in a quantitative discipline (such as Mathematics, Statistics, Economics and Finance) and are aspired to work as a professional in the quantitative risk management fields. A special session will be dedicated at the end of this course to discuss career paths and the unique changes and challenges facing quants. Students will have opportunities to connect and network with quant professionals from the industry.

Students will find this course informative, educational and insightful.

## **KEY LEARNINGS**

- Understand the fundamentals of credit risk management and regulatory requirements
- Gain knowledge of best-practice credit risk modeling using statistical procedures and data mining techniques
- Gain practical experience in building credit risk models from the ground up and incorporate sensitivity analysis to arrive at a range of credit loss estimates for different business and regulatory applications
- Get exposure to industry best practices in managing model risk throughout model life cycle
- Familiar with job markets for quants and get to know about the changes and challenges facing quants
- Network with quant professionals from the industry

# Course Outline

## **Module 1 –Credit Risk Management Overview**

- Types of Risk and General Concepts of Risk Management
- Credit Risk Management and Applications of Credit Risk Models: Account Acquisition and Management, Pricing Strategies, Capital Requirements, Allowance for Loan Losses, Macroeconomic Stress Testing
- Regulatory Requirements and Compliance: Basel, Comprehensive Capital Analysis and Review (CCAR), Dodd Frank Annual Stress Testing (DFAST) and Financial Reporting Standards (IFRS9)

## **Module 2 - SAS and Practical Statistical Procedures**

- Introduction of SAS Programming
- Overview of Practical Statistical Procedures and Methods for Credit Risk Modelling
- Other Commonly Used Statistical Analysis Software
- **Hands-on Exercises of SAS Programming**

## **Module 3 - Credit Risk Model Development**

- Target Variable Definition (binary versus continuous)
- Historical Data Sources and Quality Review
- Modeling Datasets for Development and Validation
- Key Drivers and Variable Selection
- Regression and Weights of Evidence
- Back-testing and Sensitivity Analysis
- Point-in-Time versus Through-the-Cycle Estimates
- Macroeconomic Stress Testing

## **Module 4 - Credit Risk Modeling: Credit Scoring and Applications**

- Data Mining and Scorecard Development Process
- Decision Tree and Portfolio Segmentation Approaches
- Scorecard Scaling and Formula
- Credit Score Cut-off and Decision Making
- **A Case Study using SAS and Data Mining**

## **Module 5 - Credit Risk Modeling: Credit Loss and Capital Assessment**

- Credit Risk Parameter Models - Probability of Default (PD), Exposure At Default (EAD) and Loss Given Default (LGD)
- Model Validation, Back-testing, and Benchmarking
- Expected Credit Loss Calculation
- Credit Risk Weighted Asset and Capital Calculation
- Model Stress Testing
- Model Usage for Basel, CCAR and IFRS9
- **A Case Study using SAS and Excel**

## **Module 6 – Model Risk Management and Quant Careers**

- Model Risk Management throughout Model Life Cycle
- Three Lines of Defense
- Career Paths for Quants
- Changes and Challenges facing Quants
- What Employers are Looking for
- Networking Event: Meet and Greet Quant Professionals from the Industry