NED University of Engineering & Technology

BADRI | **DEPARTMENT OF MATHEMATICS** | **SOCIETY OF ACTUARIES**

ActuMinds 2.0: Case Study Competition

WEDNESDAY, 7TH MAY, 2025

Organized by

The ActuMinds: Case Study Competition 2025 was hosted by BADRI Management Consultancy in collaboration with the Society of Actuaries of Pakistan (SOA). This prestigious national-level event challenged university students to present innovative, data-driven solutions to complex problems in the actuarial and insurance sectors.

Competition Overview

This year's competition saw participation from 68 teams representing universities from all across Pakistan. The competition was held in two rounds:

1. First Round: All teams were required to submit presentation-based solutions to a set of actuarial case studies.
2. Final Round: Eight teams were shortlisted for the final presentation round. Remarkably, five of these eight teams belonged to the Computational Finance Department of Mathematics, NED University, showcasing the department's academic strength and technical depth.

The final presentations took place at BADRI's head office and were evaluated by a panel of respected professionals from the insurance and actuarial industries, including

- Mr. Noman Rafiq
- Mr. Syed Nayyar Hussain
- Mr. Umar Khan
- Mr. Jawed Ahmed.

Competition Results

First Position: (Team Beta Brigade)

3rd-year students from the Computational Finance, NED University:

- Rida Fatima
- Laiba Irshad
- Mehak Sheikh
- Farah Fatima Saleem

Team Beta Brigade was awarded first place for their outstanding analytical approach and forward-looking solution. Their performance earned them a cash prize of Rs. 100,000 along with a scholarship for Society of Actuaries (SOA) exam papers—a recognition of both their academic excellence and potential in the actuarial field.

Project Summary: Actuarial-Grade Turbo Pricing

Team Beta Brigade's project addressed one of the most difficult challenges in actuarial science—how to price insurance products in uncertain and volatile environments, particularly those affected by events like natural catastrophes or pandemics, where conventional models often break down. Their solution, titled Actuarial-Grade Turbo Pricing, combined classical actuarial methods with modern machine learning tools to deliver a resilient and adaptive pricing framework.

Core Components of the Model:

- GLM and XGBoost – For building a transparent yet flexible base pricing model
- GANs – To simulate synthetic catastrophic event scenarios and enhance model training
- Bayesian Credibility – To allow real-time updates of pricing after rare or sudden events
- Reinforcement Learning – To help the model learn from market behavior and adjust accordingly
- Neural Networks (VaR/TVaR) – For estimating risk exposure and capital requirements rapidly, improving on traditional Monte Carlo simulations

This comprehensive framework enabled more accurate and fair pricing while maintaining regulatory alignment, financial stability, and market responsiveness.

Link to presentation: https://www.canva.com/design/DAGmyLvaWTo/BWvNN8pRAy68BJme4h30IQ/edit?utm_content=DAGmyLvaWTo&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton

Conclusion:

Team Beta Brigade's performance at ActuMinds 2025 reflected their strong grasp of both actuarial fundamentals and advanced computational tools. Their hybrid modeling approach offered a practical and scalable solution to one of the most pressing real-world challenges in insurance pricing today.

Their achievement also speaks volumes about the strength of the Computational Finance Department at NED University, and it highlights the potential of young actuarial minds to lead the profession into a data-driven, resilient future.