PERSONAL INFOMATION

Name: Dr. Komal Batool

Role Title: Assistant Professor

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EDUCATION

- **Ph.D. in Mathematics (2025):**
  - **Institute:** NED University of Engineering & Technology
  - **Thesis Title:** *Financial Market Prediction Using Mathematical & Event Extraction Technique*
  - **Supervisors:** Prof. Dr. Mirza Mahmood Baig and Dr. Ubaida Fatima
  - **CGPA:** 3.89
- **MS in Data Engineering & Information Management (2020):**
  - **Institute:** NED University of Engineering & Technology
  - **Thesis Title:** *Design a Hybrid Model Using Machine Learning & Econometrics' Model to Predict Financial Time Series*
  - **Supervisors:** Prof. Dr. Muhammad Ali Ismail and Dr. Mirza Faizan Ahmed
  - **CGPA:** 3.26
- **BS in Computational Finance (2017):**
  - **Institute:** NED University of Engineering & Technology
  - **FYDP Title:** *To evaluate and overcome churn rate using Mathematical Models*
  - **Supervisors:** Mr. Ahmar Aleem and Noman Khalid
  - **CGPA:** 3.77 **(2nd Position)**

ACADEMIC POSITIONS

- **Assistant Professor** (October 2025 to date), Department of Mathematics, NED University of Engineering & Technology.
- **Lecturer** (July 2022 to August 2025), Department of Mathematics, NED University of Engineering & Technology.
- **Co-operative Teacher** (October 2019 to June 2022), Department of Mathematics, NED University of Engineering & Technology.
- **Research Assistant** (May 2019- September 2019), National Centre of Big Data & Cloud Computing (NCBC), NED University of Engineering & Technology.

TEACHING EXPERIENCE

- Computer Applications in Finance – BS (Computational Finance), NEDUET
- Programming Languages – BS (Computational Finance), NEDUET
- Introduction to Probability & Statistics – BS (Computational Finance), NEDUET
- Introduction to Mathematical Finance – BS (Computational Finance), NEDUET
- Financial Derivatives – BS (Computational Finance), NEDUET
- Discrete-Time Finance – BS (Computational Finance), NEDUET
- Stochastic Models in Finance– BS (Computational Finance), NEDUET
- Financial Engineering – BS (Computational Finance), NEDUET
- Continuous-Time Finance – BS (Computational Finance), NEDUET
- Financial Modeling & Business Evaluation – BS (Computational Finance), NEDUET

RESEARCH PUBLICATIONS

6. Batool, K., Ahmed, M. F., & Fatima, U. (2025)." A Comprehensive Review of Financial Market Forecasting: From Historical Data to Sentiment-based Approaches". *International Journal of Computer Applications*, 187, 58. Doi: https://doi.org/10.5120/ijca2025925965

5. Batool, K., et al., (2025) “Assessing Dynamic Hedge Effectiveness and Statistical Arbitrage with Conventional and Deep Learning Models in Equity Futures”, *International Journal of Computer Applications*,187, 57. Doi: https://doi.org/10.5120/ijca2025925919

4. Batool, K., Baig, M. M., & Fatima, U. (2025). “Meta-learning for financial Market prediction: An efficient approach with reduced computational cost”. *International Journal of Advanced and Applied Sciences (IJAAS)*, 12(11), 72-81. Doi: https://doi.org/10.21833/ijaas.2025.11.008 **[IF: 0.4]**

3. Batool, K., Baig, M. M., & Fatima, U. (2025). “Accuracy and Efficiency in Financial Markets Forecasting Using Meta-Learning Under Resource Constraints”. *Machine Learning with Applications*, 100681. Doi: https://doi.org/10.1016/j.mlwa.2025.100681 **[IF: 4.9]**

2. Batool, K., Fatima, U., & Ahmed, M. F. (2025). “Trend Prediction of DJIA index based on News Extraction from Yahoo Finance”. *International Journal of Computer Applications*, *975*, 8887. Doi: https://doi.org/10.5120/ijca2025924379

1. Batool, K., Ahmed, M. F., & Ismail, M. A. (2022). “A hybrid model of machine learning model and econometrics’ model to predict volatility of KSE-100 Index”. *Reviews of Management Sciences*, *4*(1), 225-239. Doi: https://doi.org/10.53909/rms.04.01.0125

Under Review/ Pre-print Article(s):

- Batool, K., & Fatima, U. (2025). Multi-Modal Data Driven Algorithm for Efficient Trade Market Prediction, *PREPRINT (Version 1) available at Research Square.* Doi: https://doi.org/10.21203/rs.3.rs-6509598/v1.
- Batool, K., & Fatima, U. “A Dataset for the Fusion of News Articles & Financial Market Data for Event-Driven Analysis.”

INTERNATIONAL CONFERENCE PUBLICATION

Attended International Conference of **Artificial Intelligence, Computers, Data Sciences & Applications (ACDSA) by IEEE** at Antalya Billim University in August 2025 where I presented the mentioned paper:

- K. Batool and U. Fatima, "Analysis of High Frequency Markets: Global News Impact and Efficient Market Hypothesis Insights," *2025 International Conference on Artificial Intelligence, Computer, Data Sciences and Applications (ACDSA)*, Antalya, Turkiye, 2025, pp. 1-6, doi: 10.1109/ACDSA65407.2025.11166630. **[SCOPUS]**

CERTIFICATIONS

- "*Effective PhD Supervision*", by Advanced Studies & Research Board NED, and Quality Enhancement Cell, NED University of Engineering & Technology (2025)
- Coursera certificate: “*Practical Time Series Analysis*”, by The State University of New York (2019).
- Coursera certificate: “*What is Data Science*”, by IBM (2019).
- Coursera certificate: “*Data Science Orientation*”, by IBM (2019).
- “*Microsoft Specialist 2013*” by Microsoft (2017).

FYDP PROJECT SUPERVISION

- Impact of asset-liability management on liquidity risk of listed banks.
- Modelling political instability index and its projection on PSX.
- Market modelling and analysis of ceramic tile industry in Karachi.
- Optimizing returns of hybrid funds using ANN.
- Prediction of house prices using certain factors.
- Risk based approach to evaluate performance of KMI 30 index and KSE-30 index.
- Analysis of optimal portfolio risk and return under different constraints.
- Forecasting of Risk & return of top trading industries listed in PSX using stochastic models.
- Customer Segmentation Using machine learning models.
- Prediction, comparison and visualization of premium pricing using machine learning methods.
- Comparison of Time Series Forecasting Models-ARIMA & LSTM
- Bridging health care gaps-insurance solutions for financial equity in underprivileged communities
- Assessing Dynamic Hedge Effectiveness & Statistical Arbitrage with Conventional & Deep Learning Models in Equity Futures.
- Intelligent financial management and automated investment system

UNIVERSITY SERVICES

- Class Advisor, Third Year BS- Computational Finance, (October 2019 to November 2023) – (August 2025 to date)
- LMS coordinator, Third Year BS- Computational Finance, (October 2020 to February 2021).
- Factotum final examinations, Third Year BS- Computational Finance, (October 2019 to November 2023).