# PROFORMA FOR NEW COURSE

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| 1. | Title of the Course | Statistical Finance |
| 2. | Course Number | MA6030 |
| 3. | Status of the Course | Elective |
| 4. | Structure of Credits | 3-0-0-3 |
| 5. | Offered To | PG |
| 6. | New Course/Modification to | New |
| 7. | To be Offered by | Department of Mathematics and Statistics |
| 8. | To take effect from | July 2020 |
| 9. | Prerequisite | CoT |
| 10. | Whether approved by the Department | Yes |
| 11. | **Course Objective:** To formulate financial terminologies mathematically and explore their properties. To introduce essential statistical and probability methods to solve the mathematical formulation. To analyze and apply real-life financial data via the calculus of finance. | |
| 12. | **Course Content:** Binomial no-arbitrage pricing model, capital asset pricing model, binomial model for interest rate, Black-Scholes-Merton formula, evolution of portfolio value, evolution of option value, put-call parity, value of portfolio process under the risk-neutral measure, hedging with one stock, continuously paying dividend, interest rate models, forward contract, future contract, forward-futures spread, forward price, term structure models, expected shortfall, value at risk. | |
| 13. | **Text book(s):**<br>1. Habib A, *Calculus of Finance*, 1st Edition, Universities Press (2011).<br>2. Hull J C, *Fundamentals of Futures and Options Markets*, 8th Edition, Pearson (2017). | |
| 14. | **Reference(s):**<br>1. Hult H, Lindskog F, Hammarlid O and Rehn C J, *Risk and Portfolio Analysis*, 1st Edition, Springer (2012)<br>2. Prado and M L, *Advances in Financial Machine Learning*, 1st Edition, Wiley (2018).<br>3. Shreve S E, *Stochastic Calculus for Finance II: Continuous-Time Models*, 1st Edition, Springer (2004).<br>4. Shreve S E, *Stochastic Calculus for Finance I: The Binomial Asset Pricing Model*, 1st Edition, Springer (2004). | |