ESSENTIAL READINGS

- David, H. A. and Nagaraja, H. N. (2003). *Order Statistics*, 3rd ed., John Wiley & Sons.

SUGGESTIVE READINGS:

- Arnold, B.C., Balakrishnan, N. and Nagaraja H.N. (2008). *A First Course in Order Statistics,* SIAM Publishers.
- Arnold, B.C. and Balakrishnan, N. (1989). *Relations, Bounds and Approximations for Order Statistics*, Vol. 53, Springer-Verlag.
- Ahsanullah, M., Nevzorav, V.B. and Shakil, M. (2013). *An Introduction to Order Statistics, Atlantis Studies in Probability and Statistics*, Vol. III. Atlantis Press.
- Shahbaz, M.Q., Ahsanullah, M., Shahbaz, S.H. and Al-Zahrani, B.M. (2016). *Ordered Random variables: Theory and Applications*. Springer.

Note: Examination scheme and mode shall be as prescribed by the Examination Branch University of Delhi, from time to time.

GENERIC ELECTIVE COURSE–8B: STATISTICS INFINANCE

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Statistics in Finance	4	3	0	1	Class XII pass with Mathematics.	Basic knowledge of Calculus, Probability theory and Financial markets

Learning Objectives
The learning objectives include:

- To study the Financial Statistics which deals primary and secondary financial markets and the mathematical models used by these markets?
- To study to deal with the risks in financial markets

Learning Outcomes:
After completing this course, students should have developed a clear understanding of:\

- Primary financial markets and their products such as equity, bonds and cash deposits
- Secondary financial markets and their products such as futures, forwards and options (American and European)
- Applications of stochastic models to price various secondary financial markets products.
- Hedging techniques

SYLLABUS OF GE-8B
Theory

UNIT I **(12 hours)**
Theory of interest rates
Theory of interest rates- Simple and compound interest, Nominal and effective rates of interest, interest rates of varying frequencies, continuous rates, accumulation and discount factors, relationship between interest rates and discount rates, present value, future value.

Unit II **(14 hours)**
Project appraisal and investment performance
Project appraisal and investment performance- Net present value, IRR, effect of taxation, Valuation of securities-fixed asset securities, related assets, perpetuities, bonds, coupon rates, bond-pricing formula.

Unit III **(14 hours)**
Introduction to derivative pricing
An introduction to derivative pricing- arbitrage, futures and forwards, European options- Call and put, put call parity, volatility, Black-Scholes option pricing formula, binomial model of option pricing. Hedging- delta, gamma and theta.

PRACTICAL/LABWORK–(30hours)

List of Practical:
1. Relationship between various interest and discount rates
2. Calculation of present values and future values of cashflows
3. To compute NPV and to obtain IRR of the investments.
4. To compute bond price and yields
5. To verify "no arbitrage" principle.
6. To price future/ forward contracts
7. To price options using Black–Scholes formula.
8. Pricing of options using discrete time models.
9. Call-put parity for options.
10. Application of Greeks to hedge investment portfolios.

Practical work to be conducted using electronic spreadsheet / EXCEL/ Statistical Software Package/ SPSS/ calculators.

ESSENTIAL READINGS

- David, G.L. (2015). Investment Science, Oxford University Press (South Asian edition).
- John C. Hull and Sankarshan Basu (2018) (10th edition) Options, Future and other derivatives, Pearso Indian edition

SUGGESTIVE READINGS:

- Franke, J., Hardle, W.K. and Hafner, C.M. (2019- softcover published and eBook published). *Statistic of Financial Markets: An Introduction*, 3rd Ed., Springer Publications.
- Garrett S.J. (2013) An introduction to the mathematics of Finance: A deterministic approach, 2nd edition, Elsevier
- Ambrose Lo (2018): Derivative Pricing: A problem-based primer, Chapman & Hall

Note: Examination scheme and mode shall be as prescribed by the Examination Branch University of Delhi, from time to time.