

**DEPARTMENT OF MATHEMATICS,  
UNIVERSITY OF KARACHI,**

**Course Outline**

**MATH 634: MATHEMATICAL STATISTICS – II    (2 + 1)**

**Course contents:**

Distribution of two random variable, the correlation coefficient, conditional distributions, conditional expectations, transformation of random variables, chi-square, T and F distributions. Point estimation, sufficiency and completeness, confidence intervals for means, difference of two means, variance and proportions, sample size, order statistics, Asymptotic distribution of maximum likelihood estimators.

Test of statistical hypotheses: testing mean with known / unknown variance, equality of two normal distributions, chi-square goodness of fit test, contingency tables, Kolmogorov-Smirnov goodness of fit test,

Linear and Multiple regressions. Power of a statistical test, best critical regions, likelihood ratio test

**Books Recommended:**

1. Robert, V. H., Allen, C. and Joseph W. M., Introduction to Mathematical Statistics, Prentice Hall, 2004.
2. Elliot, A.T. and Robert V. H., A brief Course in Mathematical Statistics, Amazon, Com. Inc.2007.
3. Richard, J. L. and Morris L. M., An introduction to Mathematical Statistics, Prentice Hall, 2000.
4. Larsen, R. J. and Marx, M. L., An introduction to Mathematical Statistics and its Applications, Englewood Cliffs, N. J., 2005.
5. Bain. L. J. and Engelhardt. M., Introduction to probability and Mathematical Statistics, Third Edition, Dluxbury Press, 1992.
6. Balakrishnan, N. and Cohen, A. C. Order Statistics and Inference, Academic Press, Inc., New York, 1991.
7. Casella, G. and Berger, R. L. Statistical Inference, Second Edition, Wadsworth Publishing Company, 1999.
8. Hoog, R. V. and Tanis, E. A. Probability and Statistical Inference, Seventh Edition, Prentice Hall, 2005.

9. David, H. A., Order Statistics, Second Edition, John Wiley and Sons, New York, 1981.
10. Mood, A. M., Graybill, F. A. and Boes D. C., Introduction to the Theory of Statistics, Third Edition, McGraw-Hill, 1974.
11. Shao, J., Mathematical Statistics, Second Edition Springer, 2003.
12. Wakerly, D. R., Mendenhall, W. W. and Scheaffer, R. L., Mathematical Statistics with applications, Duxbury Press, 2007.
13. Johnson N. L., Kotz S. and Balakrishnan N., Continuous Univariate Distribution, Vol 1, Second Edition, Wiley Interscience Pub., John Wiley and Sons Inc., 2000.