Module Code:	STAT-303 STAT-304
Module Title:	• Design and Analysis of Experiments (Theory) – 3 Credit Hours • Practical – 1 Credit Hour
Name of Scheme:	BS Statistics

Course Outline

1. Concept of experiment. Planning of experiment. Design of experiment and its terminology. Principles of experimental designs. Analysis of Variance (ANOVA). Inference about means after ANOVA. Multiple comparison tests: LSD test, Duncan's test, Tukey's test, Orthogonal contrast test, Scheffe's Test, Transformations.
2. Layout and analysis of Completely Randomized, Randomized Complete Block, Latin Square and Graeco-Latin Square designs. Estimation of missing observations. Relative efficiency of these designs. Fixed, Random and Mixed effect models. Expected mean squares deviations. Partitioning of treatment and error SS. Orthogonal Polynomials.
3. Covariance analysis for Completely Randomized, Randomized Complete Block and Latin Square designs; single and double covariates.

Books Recommended

1. Cochran, W.C. and Cox, G.M. "Experimental Design" John Wiley and Sons, New York, Second Edition, 1957.
2. Montgomery, D.C. "The Design and Analysis of Experiments". John Wiley and Sons, New York, Fourth Edition, 1997.
3. John, J.A. and Quenoville, M.H. "Experiments and Analysis of Experiments", Charles Griffin & Co. London, Second Edition, 1977.

Reference Books

1. Kempthorone, O. & Hin Kelmann, K. "Design and Analysis of Experiments, Vol.1", John Wiley and Sons, New York, 1994.
2. Barker, T.B. "Quality by Exp. Design", Second Edition, 1994, Marcel Dekker, Inc. New York.
3. Boniface, D.R., "Experiment Design and Statistical Methods for Behavioural and Social Research", Champman & Hall, London, First Edition, 1995.
4. Ostle, B. and Mensing, R.W. "Statistics in Research" The lowa State University Press, New York, Second Edition, 1971.
5. Winer, B.J. "Statistical principles in Experimental Design", McGraw-Hill Book Company, New York, Second Edition, 1971.
6. Federer, W.T. "Experimental Design". Macmillan Company, New York, 1955.
7. Graybill, F.A. "An Introduction to Linear Statistical Models Vol.1", McGraw Hill Book Company, New York, 1961.
8. Heath, D. "An Introduction to Experimental Design and Statistics for Biology", UCI Press, London, Second Edition, 1996.
9. Clewer, Alan, G. "Practical Statistics and Experimental Design for Plant and Crop Science", Wiley, N.Y., 2001.
10. Quinn Gerry, P. "Exp. Design and Data Analysis for Biologists", Camb. Press, Cambridge, 2002.
11. JeffWu, C.F. "Experimental: Planning Analysis", Wiley N.Y., 2002.
12. Kuehl, R.O., "Design of Experiments: Statistical principles of research design and analysis" Duxbury, Boston, 2000.