

Pre-requisite: STA 221

Purpose

To guide the learner in planning and designing of experiments in real life situations.

Expected learning outcome

By the end of the course, students should be able to:

- i. State and explain the principles of experimentation.
- ii. Plan, design and investigate an experimental procedure.

Content

Principles of experimentation: randomization, replication and local control; Technique error control; Analysis of variance, pure random and mixed models; Applications to simple experimental designs like completely randomized, Latin squares, randomized blocks and Graeco-Latin squares; Analysis of three-way classification model; Missing plot technique; Construction of orthogonal (DIB) designs; Simple factorial designs.

Mode of delivery

Lectures, class demonstrations, oral presentations by the students, group discussions and Tutorials: practical exercises.

Instructional materials

Black and white board, chalk, white-board marker, duster, computer and projector.

Core References

- Dean, A. and Voss D. (1998). *Design and Analysis of Experiments*. Springer: New York: John Wiley & Sons, Inc.
- Gupta S.C. and Kapoor, V. K. (1978). *Fundamentals of mathematical Statistics*. New Delhi: Sultan Chand and Sons.
- Kuehl, R. O. (1994). *Statistical Principles of Research Design and Analysis*. California: Belmont,.
- Montgomery C. D. and Runger C. G. (2003). *Applied Statistics and probability for Engineers*. New York: John Wiley & Sons, Inc..
- Rao, P. S.R.S. (2000). *Sampling Methodologies with Applications*, New York: Chapman & Hall/CRC.
- Soong, T.T. (2004). *Fundamentals of Probability and Statistics for Engineers*. New York: John Wiley & Sons, Inc..
- Spiegel, M. R., John S. and Srinivasan, R. A. (2001). *Probability and Statistics*, Third Edition; Schaum's Outline Series. New York: McGraw-Hill.