DS802   **DESIGN OF EXPERIMENTS**   **3-0-0-3**

Course outcome / Learning Objectives: How to design and conduct experiments, and how to analyze them properly to answer various research questions.1

Randomization: Observational studies and randomized experiments, confounding, practical considerations when performing randomization,

Completely randomized designs: t-test, power and sample size calculations, non-normal observations

Factorial designs: factorial structures, main effects and interactions, interaction plots, ANOVA for balanced factorials, general factorial model, hierarchical factorial model, factorial contrasts, power and sample size calculation for factorial models

Mixed effects models: models with random effects, ANOVA for random effects, crossed and nested factors, Hasse diagrams,

Block designs: randomized complete block design and latin squares, crossover design, incomplete block designs, split-plot designs.

TEXT BOOKS / REFERENCES:
1. D. Montgomery, "Design and Analysis of Experiments", Eigth Edition, Wiley, 2013.
2. D. Cox and N. Reid, "The Theory of the Design of Experiments", CRC Press, 2000.
3. K. Hinkelmann and O. Kempthorne, "Design and Analysis of Experiments, Wiley, 1994.
4. G. Box, J. Hunter and W. Hunter, "Statistics for Experimenters", Second Edition, Wiley, 2005.
5. G.Oehlert - A First Course in Design and Analysis of Experiments, W.H.Freeman, 2000.