Syllabus for Ph.D Entrance-Test 2016

UNIT- 01 PROBABILITY AND DISTRIBUTION THEORY


UNIT- 02 SAMPLING THEORY


Recommended by Departmental Committee (Statistics):

Dr. Anwar Hassan (Prof. & Head)  
Dr. Tariq Rashid Jan (Sr. Assistant Professor)  
Dr. Sheikh Parvaiz Ahmad (Sr. Assistant Professor)
UNIT- 03  LINEAR MODELS & DESIGN OF EXPERIMENTS

Gauss Markov set up, Model classification, Normal equations and least squares estimates, Error and estimation space, Variance and covariance of least square estimates, Estimation of error variance, estimation with correlated observations, least square estimates with restriction on parameters. Test of hypotheses for one and more than one linear parametric functions, Tests of linear hypotheses, estimable linear hypotheses. Fixed, random and mixed effect model, simple and multiple regressions. Design of experiments: Introduction to basic designs and their analysis, Balance Incomplete Block Design. Intra block analysis, Inter block analysis, recovery of inter block information; General factorial experiments, factorial effects; best estimates and testing the significance of factorial effects; study of 2 and 3 factorial experiments in randomized blocks; complete and partial confounding.

UNIT- 04  STATISTICAL INference


Recommended by Departmental Committee (Statistics):

Dr. Anwar Hassan  
(Prof. & Head)

Dr. Tariq Rashid Jan  
(Sr. Assistant Professor)

Dr. Sheikh Parvaiz Ahmad  
(Sr. Assistant Professor)
UNIT-05 : MULTIVARIATE ANALYSIS


UNIT- 06 INDUSTRIAL STATISTICS & RELIABILITY THEORY

Consumer and producer’s risk, Operating Characteristic curve/function (OC). Corrective Sampling Plan (CSP), Average Sample Number (ASN), Average out-going Quality (AOQ), Graphical method of drawing AOQ, Average out-going Quality Limit (AOQL), Single Sampling Plan, Methods of finding n and c, Double

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Sampling Inspection Plan, Sequential Sampling Plan. Plans for Inspection by
Variables for one-sided specification. Sequential Analysis: Definition of
Sequential Probability Ratio Test (SPRT). Fundamental relations among \( \alpha \), \( \beta \),
A and B. Reliability concepts, hazard rate, distribution of longevity and moments,
common life distributions, exponential, Weibull, normal distributions. Type I and
Type II censored samples with replacement. Reliability of a system with independent
units connected in (a) series and (b) Parallel systems.

UNIT- 07 OPERATIONS RESEARCH

Simplex method, Revised Simplex Method, Transportation, duality theorems,
Complementary Slackness theorem and conditions, Dual Simplex Method,
Sensitivity Analysis. Sequencing and scheduling problems, 3 machine n-job
problems with identical machine sequence for all jobs; 2-job n-machine problem
with different routings. Project management; PERT and CPM. Decision Making in
the face of competition, two–person, Zero sum games, Games with mixed
strategies, existence of solution and uniqueness of value in zero-sum games,
finding solutions in mxn games, Equivalence between game theory and linear
programming problem. Multistage decision processes and Dynamic Programming,
Multi Criterion and Goal Programming.EOQ problem with and without shortages
with (a) production is instantaneous, Dynamic rogramming. Queuing models-
specifications and effectiveness measures. Steady-state solutions M/M/1 and
M/M/c models with associated distributions of queue-length and waiting time.
M/G/1 queue. Steady-state solutions of M/Ek/1.Nonlinear programming,
Formulation, Lagrange multiplier Technique, Kuhn-Tucker necessary and
sufficient conditions for optimality of an NLPP, Quadratic Programming
problems, Wolfe’s and Beal’s algorithms for solving quadratic programming
problems.

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Members of DRC:

Dr. Sheikh Parvaiz Ahmad
(Sr. Assistant Professor)

Dr. Tariq Rashid Jan
(Sr. Assistant Professor)

Dr. Anwar Hassan.
(Prof. & HOD)