

UNIVERSITY SCHOOL OF CHEMICAL TECHNOLOGY
SCHEME OF EXAMINATION Ph.D (CHEMICAL ENG./CHEMICAL TECH.)

Paper ID	Paper	L	T	P	Credit
	CT-713 Research Methodology and Data Analysis	3	1	0	4

UNIT I

6 Hrs

Scientific research: Meaning, characteristics, and significance of the scientific research. Steps of the research process, Research presentation, Data/ Literature sources and their access.

UNIT II

14 Hrs

Descriptive Statistics and Measures of Variability: Representation of data: Mean absolute deviation, variance, standard deviation and their calculation; z-scores; Coefficient of variation. Normal curve and its importance in choosing a statistics, Steven's level of measurement, descriptive statistics, inferential, parametric test, Non-parametric test.

UNIT III

12 Hrs

Regression Analysis and Correlation: Correlation; Single and multiple regression analysis; Residual analysis; a Standard error of estimate; Coefficient of determination; Estimates.

Statistical Interference: Hypothesis testing; z- statistics and t-statistics; Sampling and data collection: Analysis of variance (ANOVA)

UNIT VI

(12 Hrs)

Research Design: Basis principles of experimental design: Types of experimental design; Factorial design of experiment; Box Wilson method; Response surface analysis: Design of experiments and analysis of data using statistical software like Design Expert etc. with application to chemical/ biochemical engineering problems and different case studies.

Books:

1. Kothari, C.R. (2006), Research Methodology, New Age International Publisher.
2. Black, Ken.. (2013), Applied Business Statistics, Wiley India Edition.
3. Mickley, H... Sherwood, T.K... Reed... C.E... (2001), Applied Mathematics in Chemical Engineering, Tata McGraw Hill Publishing Company Ltd.