GUJARAT TECHNOLOGICAL UNIVERSITY

Production Engineering

B. E. SEMESTER: VI

Subject Name: **Statistical Methods and Quality Control**
Subject Code: **162501**

Teaching Scheme				Evaluation Scheme		
Theory	**Tutorial**	**Practical**	**Total**	**University Exam (Theory) (E)**	**Mid Sem Exam (Theory) (M)**	**Practical (I)**
4	2	0	6	70	30	50

Sr. No.	Course Contents	Total Hrs
1.	**Introduction to Statistical Methods** Statistics & Managerial Decisions, Statistical Data, Operation Research Techniques.	06
2.	**Data Collection And Analysis** Collection and presentation of data in terms of tables, graphs, raw data, frequency distributions, histogram etc. Cumulative frequency curve. Measures of central tendency and location, Partition values. Comparison of various measures of central tendencies. Measures of dispersion, skewness & kurtosis, comparison of various measures of dispersion, Moments as measures of Statistical properties, measures of skewness & kurtosis based on moments.	10
3.	**Probability Distribution & Statistics** Introduction of Probability, sample, space & events, Basic rules of probability, permutation & combinations, conditional probability, Baye's theorem, distributions: Binomial, Poisson, Exponential and Normal distribution with their properties and application. Random variables - discrete and continuous probability distribution functions, probability density functions, mean medium, moment and moment generating functions of Binomial, Poisson, geometric & hyper geometric. Concept of joint probability distribution.	10
4.	**Correlation And Regression Analysis** Curve fitting, correlation and regression analysis, Autocorrelation, Multiple regression, statistical Inference & estimation applied to Industrial problems	08

5.	**Statistical Tests and Testing of Hypothesis** Elementary theory and practice of sampling, standard error or means and variance, tests of significance, T test, F test, Z test and chi-square test along with their applications, Goodness of fit, testing of hypotheses and decision making, analysis of variance (ANOVA).	10
6.	**Introduction to Quality Control** Quality control-its introduction and benefits, Variation in processes: factors, process capability & Its analysis, control charts for variables and attributes, Establishing & interpreting control charts.	08
7.	**Acceptance Sampling** Concept, sampling by attributes, single and double sampling plans, inspections by samples, AQL, LTPD, consumers and producer's risk, construction and use of operating characteristic curves, use of standard sampling tables and related IS, design of experiments, sampling by variables, continuous sampling plan, vendor ratings.	08

Text Books:

1. Quantitative Techniques for Managerial Decision by Srivastava, New Age
2. Probability & Statistics for Engineers by Rao, SCITECH
3. Statistical Quality Control by Mahajan, DhanpatRai

Reference Books:

1. Statistics for Management by Lewis, Pearson
2. Quantitative Techniques in Management by Vohra, TMH
3. Applied Statistics & Probability for Engineers by Sharma, Willey
4. Introduction to Probability & Statistical Application by P.A. Meyer
5. Quality planning and analysis by J.M. Juran & Frank M. Gryna.
6. Quality and Reliability and integrated approach by Smith