



SARVAJANIK UNIVERSITY
Sarvajanik College of Engineering and
Technology
Bachelor of Engineering



B E IInd Year: Semester – IV
Subject Name: Statistics for Textile Engineering Subject Code: BTAS11403

Type of course: ESC

Prerequisite (if any): Basic knowledge of mathematics & statistics.

List of Courses where this course will be prerequisite:

Rationale: Knowledge of Statistics tool is one of the important steps to control/improve quality of textile material / process for any textile engineer. The content of the course covers the concepts of statistics and its application for analysis & control of various textile related processes and materials.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
4	0	0	4	60	25	15			100

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests CA2: Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

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Sr. No.	Content	Total Hrs
1	Basic Statistics for Textile materials/processes: Introduction to statistics, Need & advantages, Collection of Data for textile material or process, Population and sample, Graphical representation of data, types of distribution curves, Measure of central tendency - Mean, Median and Mode, Partition values – Quartiles, Deciles and Percentiles.	6
2	Measurement of Dispersion of Textile raw materials, intermediate products and processes. Dispersion – Range, Quartile Deviation, Mean Deviation, Standard Deviation, Coefficient of Range, Coefficient of Quartile Deviation, Coefficient of mean Deviation, Coefficient of Variation, Variance.	4
3	Skewness and Kurtosis related to Textile mill data. Skewness around AM, Symmetric frequency distribution, Skewed frequency distribution, Measures of Skewness – Karl Pearson's coefficient of Skewness and Bowley's Coefficient of Skewness, Kurtosis, Measures of kurtosis.	6
4	Correlation and Regression of Industrial data. Types of Correlation, Measure of correlation – Scatter Diagram and Karl Pearson's Coefficient of Correlation, Coefficient of determination, Spearman's Rank Correlation Coefficient, Regression analysis.	6
5	Basic of Probability & Probability Distribution of textile data. Experiment, Definition of probability, Laws of probability, Binomial probability distribution, Properties of Binomial distribution, Poisson probability distribution, Properties of Poisson distribution, Normal probability distribution, Properties of Normal distribution, Chi-square probability distribution, properties of Chi-square distribution,	8
6	Sampling Methods to collect data for textile material and Determination of Number of test.	4

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	Types of sampling methods – Probability and Non-Probability, Number of Test for assessment of quality of textile product & its impacts.	
7	Application of Statistics for textile data. Formation of Hypothesis, Test of significance for Small samples: t- Test for single mean, difference of means, t-test for correlation coefficients, F- test for ratio of variances, Chi-square test for goodness of fit and independence of attributes.	8
8	Control Charts to control quality of textile product / processes. Introduction and Significance of Control Chart, Control Charts for Variable (X-bar and R Chart), Control Charts for Attributes (p, n p, c charts)	4
9	Planning of textile Experiment using Design of Experiment (DOE). Use of DOE, Guideline for designing of experiment, Classification of Design of Experiment, Two level and three level factorial design.	6
10	Use of Analysis of Variance for Interpretation data collected from experiment. One way ANOVA and Two way ANOVA,	8

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
15	10	10	10	10	05

**Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate
 C: Create and above Levels (Revised Bloom’s Taxonomy)**

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

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Sr no	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition
1.	Statistics for Textile Engineers	J. R. Nagla	WPI Publishing; ISBN : 9789380308265	2014	1 st edition
2.	Statistics for textile and Apparel management	J. Hayavadana	WPI Publishing ; ISBN : 9789380308043	2012	1st edition
3.	Principles of Textile Testing	J. E. Booth	CBS Publishers & Distributors ; ISBN : 9788123905150	1996	3rd edition
4.	Introduction to Statistical Quality Control	Douglas C. Montgomery	John Wiley & Sons, Inc. ISBN :978-0470169926	2008	6th edition

Course Outcomes:

Sr. No.	CO statement	Marks % weightage
CO-1	Understand the centre tendency, correlation and correlation coefficient and also regression.	25
CO-2	Understand significance of dispersion for textile material / process	20
CO-3	Understand the probability distribution.	15
CO-4	Apply statistics for testing the significance of the given large and	20

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	small sample data by using t- test, F-test and chi-square test.	
CO-5	Understand the significance of DOE, its calculation and interpretation of ANOVA	20

Mapping with POs:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3
CO-1	2	2	2	3	3	1	2	0	0	1	2	2	2	3	3
CO-2	2	2	2	3	3	1	2	0	0	1	2	2	2	3	3
CO-3	2	2	2	3	3	1	2	0	0	1	2	2	2	3	3
CO-4	3	2	2	3	3	1	2	0	0	1	2	2	2	3	3
CO-5	3	2	2	3	3	1	2	0	0	1	2	2	2	3	3
Ratio nale*	3	2	2	3	3	1	2	0	0	1	2	2	2	3	3

Rationale*: Explaining why it is matching this particular program outcome

The knowledge of statistics and the application for analysis & control of various textile related process and materials leads to the achievement of the various PO.

List of Open learning website: <https://nptel.ac.in>, World Wide Web, Google Search Engine etc

List of Open Source Software: R, JASP, Salstat, etc.

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