

Annexure 2

Detailed Syllabus for Each Course B.S. (Hons.) DSA

DSM111 Statistics for Data Science

Semester: I	Course Title: Statistics for Data Science	Credits: 4
Course Code: DSM111		(3 T + 1 P)

Course Outcomes: On successful completion of the course the learner will be able to

CO	COGNITIVE ABILITIES	COURSE OUTCOMES
CO 1	REMEMBERING	Describe the basic features of data. Remember when to use which type of charts and graphs.
CO 2	UNDERSTANDING	Understand various measures of central tendency, dispersion, skewness, and kurtosis. Summarize the sample data using different charts and summary measures. Understand the concept of measures of correlation and regression.
CO 3	APPLYING	Apply the theory of descriptive statistics to various real-life situations.
CO 4	ANALYSING	Analyse statistical data using various measures of central tendency, dispersion, skewness, and kurtosis.
CO 5	EVALUATING	Evaluate the relationship between the variables and apply regression analysis to the real-life data.
CO 6	CREATING	Build a regression model for the sample data.

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	2	2	1
CO 2	2	3	3	2	1
CO 3	2	2	2	3	2
CO 4	2	3	2	2	1
CO 5	3	3	2	2	1
CO 6	3	3	2	3	1

Unit	Detailed Syllabus	Teaching Hours
I	<p>Descriptive Statistics Classification of data: Qualitative, Quantitative: Discrete, Continuous; Chronological (Time series) data. Data Types: Nominal, Ordinal, Interval, and Ratio data. Construction of frequency and cumulative frequency distribution. Presentation of qualitative data: Tabulation (up to four attributes). Graphical representation of grouped data: Histogram, frequency curve, frequency polygon, ogives (cumulative frequency curves), Diagrammatic representation of data: Bar diagrams- simple Bar, multiple bars, stacked bar chart, and percentage bar diagrams. Pie diagrams. Stem - Leaf plot.</p> <p>Measures of Central Tendency Concept of central tendency, various measures of central tendency, and their interrelationship. Their merits and demerits. The empirical relation between</p>	15

	mean, median, and mode. Properties and applications of measures of central tendency. Partition values (quartiles, deciles and percentiles.)	
II	Measures of Dispersion and Moments Concept of variation/dispersion, quartile deviation, Absolute and relative measures of dispersion with their merits, demerits, and applications. Moments: raw moments, central moments. Skewness: Concept of Skewness, measures of skewness Kurtosis: Concept of Kurtosis, measures of kurtosis.	15
III	Correlation and Regression Bivariate data, Scatter diagram, and interpretation. Covariance between two variables: Definition, and computation. Concept of correlation between two variables. Types of Correlation: Positive correlation, negative correlation, no correlation. Measures of Correlation: Karl Pearson's coefficient of correlation and its properties. Spearman's rank correlation coefficient. Meaning of regression, the difference between correlation and regression. Simple linear regression model. Estimation of unknown constants by the method of least squares. Interpretation of parameters.	15
IV	Practical Component <ul style="list-style-type: none"> • Methods of Classification and Construction of Frequency Distribution. (One-way and Two-Way). • Present the data using various diagrams and graphs. • Computation of measures of central tendency and dispersion. • Computation of partition values. • Computation of moments, coefficient of skewness, and kurtosis. • Computation of correlation coefficient (Pearson's and Spearman's). • Fitting of a simple linear regression model. • Fitting of a simple linear regression model. 	15

Suggested Reference Books:

1. Introduction to the Practice of Statistics, Moore, S. David; McCabe, P. George W. H. Freeman and Company, New York.
2. Basic Statistics, Agarwal, B. L., New Age International (P) Ltd.
3. Introduction to the theory of Statistics, Mood, A. M., Greybill, F.A., Boes, D.C., Mc Graw Hill.
4. Probability and Statistics for Engineers and Scientists. Devore, J.L. Cengage Learning, New Delhi 8th Edition, 2014.
5. Mathematical Statistics, P. Mukhopadhyay, New Central Book Agency (P) Ltd, Calcutta
6. An Introduction to Probability and Statistics, V. K. Rohatgi and A.K.Md. Ehsanes Saleh, Wiley Series.