

Structure of Statistics

Academic Year	Semester	Paper	Code
2019-20	I	Descriptive Statistics and Probability	ST 122
2019-20	II	Probability Distributions	ST222
2019-20	III	Statistical Methods and Inference-I	ST322
2019-20	IV	Statistical Inference II	ST422
2019-20	V	Applied Statistics-I	ST522
2019-20	V	SQC and Reliability	ST522A
2019-20	VI	Applied Statistics II	ST622
2019-20	VI	OPERATIONS RESEARCH	ST622A
2019-20	III	SEC-1: Data Analysis with R - I	SE322
2019-20	IV	SEC - 2 : Data Analysis with R - II	SE422
2019-20	V	SEC - 3: Data Analysis with SPSS-I	SE522
2019-20	VI	SEC - 4: Data Analysis with SPSS-II	SE622
2019-20	V	GE - 1: Data Analysis with Excel	GE522
2019-20	VI	GE - 2: Data Analysis with SPSS	GE622





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B.Sc. I year Semester I

Subject: Descriptive Statistics & Probability Paper code: ST122

Month	Sub Units	Topics to be covered	No.of classes per topic
J U N E	1	Types of collection of data	2
	2	Concept of Population and sample, quantitative and qualitative data	2
J U L Y	UNIT I		
	1	Questionnaire and Schedule	1
	2	Tabulation and Classification	1
	3	Univariate and bivariate Frequency distribution	2
	4	Measurement of scales	1
	5	Diagrammatic and Graphical presentation	2
	UNIT II		
6	Introduction of Statistics	1	
7	Measures of Central Tendency	7	
A U G U S T	UNIT II		
	1	Measures of dispersion	5
	2	Moments and their inter relation	3
	3	Skewness, Kurtosis & Sheppard's correction	2
	UNIT III		
	4	Introduction to Probability and basic concepts of probability	2
	5	Simple theorems on Probability	2
	6	Addition theorem for 2 and n events	1
	7	Conditional Probability	2
	8	Multiplication theorem for 2 and n events	1
	9	Simple problems	3
10	Baye's theorem	2	
11	Boole's inequality	1	
S E P T E M B E R	UNIT IV		
	1	Definition of r.v. and types of r.v.	1
	2	Properties of distribution function	1
	3	Functions of r.v.	1
	4	transformation of r.v.s	3
	5	Mathematical Expectations introduction	1
	6	Properties of mathematical expectations	2
	7	Properties of variances	2
	8	M.G.F. and its properties	1
	9	P.G.F. and its properties	1
	10	C.F. and its properties	1
	11	C.G.F. and its properties	1
	12	Tscheby chev's inequality	3
13	Cauchy Schwartz inequality	1	
TOTAL			62



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B.Sc. I year Semester II

Subject: Probability distributions

Paper code: ST222

Month	Sub Units	Topics to be covered	No.of classes per topic
NOVEMBER		UNIT I	
	1	Introduction to bivariate r.v. and notations	2
	2	Joint marginal and conditional distributions	2
	3	independence of random variables	1
	4	Statement and applications of W.L.L.N.	2
	5	C.L.T. for i.i.d. r.v.s with finite variance	3
			UNIT II
6	Discrete Uniform distribution	1	
7	Bernouli distribution	1	
DECEMBER		UNIT II	
	1	Binomial distribution	4
	2	Poisson distribution	5
	3	Negative Binomial distribution	3
	4	Geometric distribution	3
5	Hyper geometric distribuiton	2	
JANUARY		UNIT III	
	1	Rectangular distribution	3
	2	Normal distribution	9
		UNIT IV	
3	Exponential distribution	3	
4	Gamma distribution of first kind	2	
FEB And MARCH		UNIT IV	
	1	Gamma distribution of first kind	1
	2	Gamma distribution of second kind	3
	3	Beta distribution of first kind	2
	4	Beta distribution of second kind	2
	5	Cauchy distribution	4
6	Revision	2	
TOTAL			60



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Department of Mathematics & Statistics
B.Sc. II year Semester III

Subject: Statistical Methods and Inference - I

Paper code: ST322

Month	Sub Units	Topics to be covered	No. of classes per topic
JUNE	1	Fitting of Curves	5
	2	Theory of Attributes	8
JULY	Unit II		
	1	Correlation Coefficient	5
	2	Coefficient of determination	1
	3	Rank Correlation Coefficient	3
	4	Regression Analysis	7
AUGUST	Unit III		
	1	Basic concepts of sampling distribution	2
	2	Exact sampling distributions - t, F, χ^2	4
	3	Relation b/w t & F and F & χ^2 distribution	2
	4	Theory of Estimation basic definitions	2
5	Unbiasedness and Consistency	6	
SEPTEMBER	Unit IV		
	1	Efficiency, Sufficiency and Neyman's Factorization Theorem	5
	2	Methods of Estimation: MLE and MM	7
	3	Point Estimation, Interval Estimation and Confidence Limits	3
		TOTAL	60



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B.Sc. II year Semester IV

Subject: Statistical Inference - II

Paper code: ST422

Month	Sub Units	Topics to be covered	No. of classes per topic
November	1	UNIT - I	
		Testing of hypothesis (Concept)	5
	2	NP lemma Theorem and its applications	10
December	1	UNIT - II	
		Large Sample Tests	15
January	1	UNIT - III	
		Small Sample Tests	13
	2	Order Statistics	2
February	1	UNIT - IV	
		Non parametric Tests	15
		TOTAL	60



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B.Sc. III year Semester - V

Subject: Applied statistics - I Paper code : ST522

Month	Sub Units	Topics to be covered	No. of classes per topic
June	1	<u>Unit III</u> Time Series- Introduction	2
	2	Measurements of Trend	4
	3	Measurement of Seasonal Indices	3
July	4	<u>Unit III</u> Measurement of Seasonal Indices	2
	1	<u>Unit IV</u> Index Numbers - Introduction	1
	2	Construction of Weighted, Un weighted Index Numbers	4
	3	Base Shifting, Splicing, Deflation and CLIN	3
August	4	Indian Official Statistics	2
	1	<u>Unit I</u> Principles of sample survey	1
	2	Errors in sample survey	2
September	3	Simple Random Sampling	9
	1	<u>Unit II</u> Stratified Random Sampling	6
	2	Systematic Random Sampling	6
		Total	45



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B.Sc. III year Semester - VI

Subject: Applied statistics -II Paper code : ST622

Month	Sub Units	Topics to be covered	No. of classes per topic
November	1	<u>Unit I</u> ANOVA- Introduction	2
	2	One way classification	5
	3	Two way classification	5
December	1	<u>Unit II</u> Design of Experiment- Introduction	2
	2	Completely Randomized Design	3
	3	Randomised Block Design	3
	4	Latin square Design	4
January	1	<u>Unit III</u> Vital statistics- Introduction	2
	2	Fertility Rate, Mortality Rate and Population Growth	7
	3	Life Table	4
February	1	<u>Unit IV</u> Demand Analysis- Introduction	1
	2	Price elasticity of Supply, Demand	3
	3	Leontif's Method and Pigous Method	4
	4	Pareto's Law of Income distribution	2
		<u>Total</u>	45



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B.Sc. III year Semester - V

Subject: Statistical Quality Control & Reliability Paper code : ST522A

Month	Sub Units	Topics to be covered	No. of classes per topic
June	1	<u>Unit I</u> SQC - Introduction	2
	2	Process Control	1
	3	x-bar and R chart	2
	4	x-bar and S-chart	2
July	5	<u>Unit I</u> No. of defective chart	2
	6	No. of defects chart	2
	7	Proportion defective chart	2
	1	<u>Unit II</u> Acceptance Sampling Plan	3
August	2	<u>Unit II</u> Single Sampling Plan	6
	3	Double Sampling Plan	6
September	1	<u>Unit IV</u> Reliability Theory	9
	1	<u>Unit III</u> Six-Sigma	8
		Total	45



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B.Sc. III year Semester - VI
Subject: Operations Research Paper code : ST622A

Month	Sub Units	Topics to be covered	No. of classes per topic
November	1	<u>Unit I</u> Formulation of Linear Programming Problem	2
	2	Graphical Solutions	3
	3	Simplex Method	3
December	4	<u>Unit I</u> Big -M Method	3
	5	Two Phase Method	2
	1	<u>Unit II</u> Duality	6
January	2	<u>Unit II</u> Dual Simplex Method	6
	1	<u>Unit III</u> Transportation Problem	6
February	2	<u>Unit III</u> Transshipment Problem	4
	1	<u>Unit IV</u> Assignment Problem	6
	2	Sequencing Problem	4
		Total	45



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B.Sc. II year Semester - III

Subject: Data Analysis with R - I Paper code : SE322

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
JUNE	1	Introduction, Overview and History of R, Downloading and Installing R	2	15
	2	Getting Help, Writing Code/Setting Working Directory	2	
JUNE & JULY	3	Data types, Reading data from external sources, storing data to external files	6	
	4	Simple mathematical operations(addition, subtraction, multiplication, division, log x, ex, inverse).	5	
UNIT2				
AUG	5	Measures of Central Tendency, Measures of dispersions	4	15
	6	Diagrams and Graphs, Box plot and Scatter plot.	3	
SEP	7	Generation of Random number, Fitting of Binomial distribution	4	
	8	Fitting of Poisson and Normal distribution.	4	
		TOTAL	30	30



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B.Sc. II year Semester - IV

Subject: Data Analysis with R - II Paper code : SE422

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
NOV	1	Write a code and program for Fitting of Bernouli, Binomial distribution.	5	15
	2	Fitting of a Poison and Normal distribution.	4	
DEC	3	Computation of Correlation co-efficient	3	
	4	Simple Regression lines and forecast.	3	
UNIT2				
JAN	5	Test for Proportion(s), Mean(s), S.D.(s) for Large samples	4	15
	6	t-test for single mean, difference of means(independent and dependent samples)	4	
FEB	7	Chi-square test for goodness of fit, independent of attributes and single variance	5	
	8	F-test for difference of variances.	2	
		TOTAL	30	30



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B.Sc. III year Semester - V

Subject: Data Analysis with SPSS - I Paper code : SE522

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
JUNE	1	Introduction to SPSS Editor.	2	15
	2	general aspects, work flow, Entering data into SPSS	4	
JULY	3	Inserting and defining variables, Data entry, Data Editor	5	
	4	Sorting, Transposing, Splitting and Merging.	4	
UNIT2				
AUG	5	Frequency tables, using frequency tables for analyzing data (Central tendency).	4	15
	6	Frequency tables, using frequency tables for analyzing data (Dispersion)	4	
SEP	7	Chart builder, Histograms, line Charts, Bar Charts	3	
	8	Box plots, Error bar, Pie Charts, Scatter Plots (Simple, grouped, drop-line), Editing graphs and Axes.	4	
		TOTAL	30	30



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B.Sc. III year Semester - VI

Subject: Data Analysis with SPSS - II Paper code : SE622

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
NOV	1	Sample and Population, Concept of confidence Interval	2	15
	2	F-test	2	
DEC	3	t-test (one sample, Independent sample, Paired sample)	4	
	4	ANOVA- GLM 1	2	
	5	Cross tabulation and Chi Square analysis.	5	
UNIT2				
JAN	6	Pearson's Correlation and Spearman Correlation, Scatter plots	4	15
	7	Linear Regression , Multiple Regression (Linear) and Simple examples	4	
FEB	8	Construction of variable and attribute charts.	4	
	9	Time Series Analysis	3	
		TOTAL	30	30

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Subject: Data Analysis with Excel Paper code : GE522

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
JUNE	1	Introduction, Entering data into MS Excel, Inserting and defining variables, Data entry.	2	15
	2	Histograms, line Charts, Bar Charts, Pie Chart.	4	
JULY	3	Frequency tables, using frequency tables for analyzing data (Central tendency).	5	
	4	Frequency tables, using frequency tables for analyzing data (Dispersion).	4	
UNIT2				
AUG	5	Pearson's Correlation and Spearman Rank Correlation, Scatter plots	4	15
	6	Linear Regression , Multiple Regression (Linear) and Simple examples	4	
SEP	7	Fitting of Straight line, Second degree Parabola	3	
	8	Fitting of Power curve and Exponential curves.	4	
		TOTAL	30	30



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Subject: Data Analysis with SPSS Paper code : GE622

UNIT NO.	SUB UNIT	TOPICS	PERIODS PER SUBUNIT	TOTAL PERIODS
UNIT1				
NOV	1	Introduction, Entering data into SPSS Editor, Inserting and defining variables, Data entry.	2	15
	2	Chart builder, Histograms, line Charts, Bar Charts	4	
DEC	3	Box plots, Error bar, Pie Charts	4	
	4	Scatter Plots (Simple, grouped, drop-line), Editing graphs and Axes.	5	
UNIT2				
JAN	5	Frequency tables, using frequency tables for analyzing data (Central tendency and dispersion).	4	15
	6	Pearson's Correlation and Spearman Rank Correlation	4	
FEB	7	Scatter plots, Linear Regression , Multiple Regression (Linear) and Simple examples.	4	
	8	Simple forecasting techniques.	3	
		TOTAL	30	30