COMMISSONERATE OF COLLEGIATE EDUCATION,

GOVT. DEGREE COLLEGE

RAJAMPET, KADAPA. Dt.

(Affiliated to Yogi Vemana University, Kadapa.)

TEACHING PLAN

ACADEMIC YEAR 2020 -20 21

Name of the Department : Statistics

NAME OF THE LECTURER : C. Kalyani

Course / Group : B.Sc (MSCS)

Subject / Page : Statistics

Sl.No.	Subject	Paper	Page No.
1	Descriptive statistics & probability distributions	paper-I	
2	Statistical Methods & Sampling	paper-III	
3	Sampling theory & Design of experiments	paper-V	
4	Statistical quality Control & Reliability	paper-VI	

III Semester

November 2020

Teaching Plan / Lesson No.

Name of the Topic	Curve fitting
Hours required	
Learning Objectives	Bivariate data, principle of least squares, curve fitting defination, fitting of a straight line
Previous knowledge to be reminded	Taking a Mathematical model for the data and also example for the prediction of long term trend
Examples / Illustrations	Examples of prediction purpose of long term trend
Additional inputs	
Teaching Aids used	Blackboard, chalk & Duster
References cited	Telugu Academy Textbook - prof A. Mohan rao
Student Activity Planned after the teaching	preparation and learning and solving problems
Activity planned outside the class room, if any	Solving the problems of straight line
Any other activity	Refer the text books
Topic Synopsis	*(Continue on the reverse side if needed)* → Introduction of curve fitting → Defination, uses of curve fitting → fitting of a straight line → problems of a straight line. Curve fitting :- Curve fitting is a method

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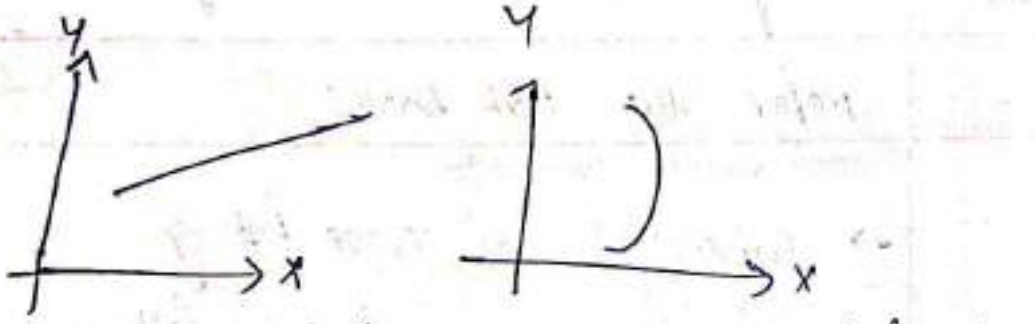
which we determine a suitable mathematical relationship between the independent & the dependent variables with the help of principle of least squares

Let (x_i, y_i) ; $i = 1, 2, \ldots n$ be given set of n pairs of values x being independent variable and y be the dependent variable. In general problem in curve fitting is defined to find if possible an analytical expression of the form $y = f(x)$. Then the functional relationship suggested by the data. There may be two types of relationship exist bth two variables namely

1) Linear relationship
2) Non linear relationship



Linear relationship Non-linear relationship

Teaching Plan / Lesson No.

Name of the Topic	Fitting of parabola, power curve
Hours required	
Learning Objectives'	Fitting of parabola and its alternate method problems; Fitting of power curve & its problems
Previous knowledge to be reminded	Here we are using the equation of parabola $y=ax^2+bx+c$ and taking origin & scale
Examples / Illustrations	Example of year & production sales
Additional inputs	providing information how to use statistics in life
Teaching Aids used	Blackboard, chalk and duster
References cited	Statistical Methods and reference text books
Student Activity Planned after the teaching	preparation and learning, solving the problems of power curve, parabola
Activity planned outside the class room, if any	Solving the problems of parabola, power curve
Any other activity	Refer the text book
Topic Synopsis	*(Continue on the reverse side if needed)* Fitting of power curve :- Let $y = ax^b \rightarrow$ be the power curve to be fitted to a set of 'n' points (x_i, y_i) ; $i = 1, 2, \ldots n$

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Taking logarithm on both sides of eq(i) we get

$$\log y = \log a + b \log x$$

$$\Rightarrow \quad U = A + BV$$

Where $U = \log y$, $A = \log a$, $V = \log x$

Teaching Plan / Lesson No.

Name of the Topic	Design of Sample surveys
Hours required	
Learning Objectives	Census Method, Sampling & Non sampling errors, Steps in survey
Previous knowledge to be reminded	Definations of Sampling, statistic, standard error, standard deviation
Examples / Illustrations	population, students in a college, Day's production of a industry
Additional inputs	
Teaching Aids used	Black by Google meet
References cited	Telugu Academy text book - Dr. A. Anand
Student Activity Planned after the teaching	Revision of principle steps in a Sample survey
Activity planned outside the class room, if any	writing the other examples of Sampling and some extra steps in survey
Any other activity	Refer the textbooks
Topic Synopsis	*(Continue on the reverse side if needed)* Census Method:- In Census 100.1. inspection of population and it enumerates each & every unit of the population. Census method provides more accurate and exact values (or) results. Census generally conducted by

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The government and big organisations only because it is time consuming and requires lot of money.

Generally in India for every 10 years population census conducted by the Govt of India, Census means not only population, & also related to religion, age, Marital status, occupation, employment, income and property etc.

Drawbacks of Census Method:-

* Census method requires lot of money, man power & time.
* Census is very time consuming

Teaching Plan / Lesson No.

Name of the Topic	Design of Sample Surveys
Hours required	
Learning Objectives	Types of sampling, sampling methods, Differences bth census & sampling method
Previous knowledge to be reminded	population, sample, statistic
Examples / Illustrations	population, organization
Additional inputs	
Teaching Aids used	Google meet
References cited	Telugu academy textbook - prof K. Srinivas rao
Student Activity Planned after the teaching	preparation & learning
Activity planned outside the class room, if any	Solve the problems of SRS
Any other activity	Refer the text books
Topic Synopsis	*(Continue on the reverse side if needed)* Types of sampling :- The method of Selecting a sample depends on the nature of the data and types of enquiry. There are 3 types of sampling which are listed below

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1. Subjective Sampling
2. probability Sampling
3. Mixed Sampling

V Semester
paper-VI

Teaching Plan / Lesson No.

Name of the Topic	statistical Quality control
Hours required	
Learning Objectives	SQC & control charts to represent the quality process by using charts, 3σ limits
Previous knowledge to be reminded	Taking some real life examples of industries
Examples / Illustrations	Industries like petroleum, medicine, plastic
Additional inputs	
Teaching Aids used	Google meet
References cited	Quality, reliability & OR - D.V.L.N Jogiraju
Student Activity Planned after the teaching	Asking questions to that topic and preparation and learning
Activity planned outside the class room, if any	Writing the examples of SQC - work for the students
Any other activity	Refer books in Library
Topic Synopsis	*(Continue on the reverse side if needed)* SQC definitions:- SQC refers to the systematic control of those variables encountered in a manufacturing process which affect the excellence of the end product. each variable are from the

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application of Materials, Man, Machines and Manufacturing Conditions - Bethel, Atwater and Stackman

Causes of variation :- There are 2 types of causes for every quality characteristics.

1. Assignable causes
2. Chance causes

III Semester

December 2020

Teaching Plan / Lesson No.

Name of the Topic	Fitting of exponential curve
Hours required	
Learning Objectives	Fitting of exponential curve Method, Correlation definition & its properties & also its measures
Previous knowledge to be reminded	Here we are taking logarithms, linear relationship btn two or more variables
Examples / Illustrations	Taking an example of population estimation in years, income, expenditure of a family
Additional inputs	Explaining another examples of correlations
Teaching Aids used	Blackboard, Chalk & Duster
References cited	Statistical Methods & Inference - Telugu Academy
Student Activity Planned after the teaching	learning the methods of curves
Activity planned outside the class room, if any	Solving the problems of exponential, parabola curve, definitions
Any other activity	Refer the textbooks
Topic Synopsis	*(Continue on the reverse side if needed)* → Fitting of exponential curve and it's problems → Correlation introduction, definition and it's properties Fitting of an exponential curve :- Let

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$y = ae^{bx} \rightarrow (1)$

be the exponential curve to be fitted to a set of 'n' points (x_i, y_i) ; $i = 1, 2, \ldots, n$.

Taking logarithm on both sides

$$\log y = \log a + bx \log e$$

$$\Rightarrow U = A + BV$$

where $A = \log a$, $B = b \log e$, $U = \log y$, $V = x$

Eq(1) is a linear equation in U and V

The normal equations are

$$\Sigma U = nA + B\Sigma V$$

$$\Sigma UV = A\Sigma V + B\Sigma V^2$$

where $\hat{a} = \text{Anti-log } A$

$$\hat{b} = \frac{B}{\log e}$$

With these values of $\hat{a}$ & $\hat{b}$ in eq(1) is the best fit to the given set of 'n' points.

Teaching Plan / Lesson No.

Name of the Topic	Spearmen Correlation
Hours required	
Learning Objectives	Correlation Ratio & its theorems, Spearmen rank correlation, Definition & its problems, derivation
Previous knowledge to be reminded	Taking the ranks, grades and correlation. Co-efficient
Examples / Illustrations	Example of ranks of students in subjects, scores of competitors in a beauty contest
Additional inputs	other information of correlation
Teaching Aids used	Black board, Chalk and Duster, Google meet
References cited	Telugu Academy text book - Dr. V. Papaiah sastry
Student Activity Planned after the teaching	preparation and learning
Activity planned outside the class room, if any	Solving the problems of spearmen rank correlation
Any other activity	Refer the related books of correlation
Topic Synopsis	(Continue on the reverse side if needed) Spearmen rank correlation :- It was developed by british psychologist charles edward spearmen in 1904. It is denoted by P. Correlation coefficient between

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between ranks of x's and y's. is called the rank correlation coefficient between A & B.

The formula is defined as

$$e = 1 - \frac{6\sum d_i^2}{n(n^2-1)}$$

where $d_i = x_i - y_i$

= difference btw the two ranks

Teaching Plan / Lesson No.

Name of the Topic	Bivariate frequency distribution, Repeated rank correlation
Hours required	
Learning Objectives	Bivariate frequency distribution & its problems Repeated rank correlation, Multiple & partial correlation
Previous knowledge to be reminded	Bivariate data, correlation, ranks and also taking an example of Ages of wives & Husbands
Examples / Illustrations	Taking an example of Judges, Ages of son & father's.
Additional inputs	
Teaching Aids used	Black board, Chalk and Duster, Goog lenotes
References cited	Statistical methods & Reference textbook - N. Srinivas
Student Activity Planned after the teaching	preparation and learning
Activity planned outside the class room, if any	Solving the problems of repeated rank correlation
Any other activity	Refer the text books in library.
Topic Synopsis	(Continue on the reverse side if needed) Multiple and partial correlation :- There distinction between simple, multiple and partial correlation is based upon the no. of variables studied when only two

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variables are studied it is a problem of simple correlation. When three or more variables are studied. It is a problem of either multiple and partial correlation.

(paper-V)

Semester-V

Teaching Plan / Lesson No.

Name of the Topic	Simple random sampling
Hours required	
Learning Objectives	Simple random sampling. Merits & this Theorems, types of SRS
Previous knowledge to be reminded	population, Sample, population size, Sample size
Examples / Illustrations	population, organization, industry.
Additional inputs	.
Teaching Aids used	Google meet
References cited	Telugu Academy text book - Dr. V. papaiah sastry
Student Activity Planned after the teaching	Solving the problems of SRS & Theorems
Activity planned outside the class room, if any	prove the some theorems of SRS
Any other activity	Refer the text book
Topic Synopsis	*(Continue on the reverse side if needed)* Simple random sampling :- A sample units selected from the population by giving equal chance to every unit is called simple random sampling. In

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this method we are giving equal probability for each unit of the population size N. Simple random sampling can be categorised in two ways.

1. Simple random sampling with replacement
2. Simple random sampling without replacement

Teaching Plan / Lesson No.

Name of the Topic	SRS for attributes
Hours required	
Learning Objectives	Simple random sampling for attributes & it's theorems, Comparison btw SRSWOR & SRSWR
Previous knowledge to be reminded	population, sample, population size, sample size, attributes
Examples / Illustrations	Estimating the demand for a consumer item like a car in a town
Additional inputs	
Teaching Aids used	Black board, Chalk & Duster.
References cited	Telugu Academy textbook - Dr. V. Papaiah Sastry
Student Activity Planned after the teaching	Explaining the SRS preparation
Activity planned outside the class room, if any	prove the theorems of SRS for attributes
Any other activity	Refer the some text books in library
Topic Synopsis	*(Continue on the reverse side if needed)* Simple random sampling for attributes :- If we want to apply the qualitative data in simple random sampling. we have to measure the characteristic of the qualitative data. The characteristic which cannot be

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be measurable is known as attributes.

for eg:- intelligance, honesty, beauty etc.

In several statistal investigation we cannot measure the given characteristics in terms of numerical values but we can measure by dividing the characteristic of the population into groups.

Notations & terminology

Let us suppose that a variable y_i, $i=1,2,\ldots N$ with pth proportion is denoted as $y_p=1$, if it is male, $y_p=0$ if it is not male. Similarly Let us associate a variabe y_i, $i=1,2,\ldots n$ then pth sample is defined as $y_i=1$ if it is rich, $y_i=0$

Semester-V
paper-VI

Teaching Plan / Lesson No.

Name of the Topic	Control Chart for variables ~~& attributes~~
Hours required	
Learning Objectives	Control Charts like $\bar{X}, R, P$
Previous knowledge to be reminded	Binomial distribution are using in this charts and also Normal distribution
Examples / Illustrations	Life of bulbs, chemical composition
Additional inputs	
Teaching Aids used	Blackboard, Chalk & Duster, Google meet
References cited	D.V.L.N JOGIRAJU, C.Sasikala, K. Ravikumar
Student Activity Planned after the teaching	preparation and writing the Construction of $\bar{X}$ & R chart
Activity planned outside the class room, if any	Solving the problems of $\bar{X}$ & R Chart
Any other activity	To refer the text books
Topic Synopsis	(Continue on the reverse side if needed) Control limits for $\bar{X}$ & R chart :- Case i) Standards are given then $UCL = E(\bar{X}) + 3SE(\bar{X}) = \mu + 3\frac{\sigma}{\sqrt{n}}$ $LCL = E(\bar{X}) - 3SE(\bar{X}) = \mu - 3\frac{\sigma}{\sqrt{n}}$

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$CL = E(\bar{x}) = \mu$

Case ii) :- Standards are not given.

$$UCL = E(\bar{x}) + 3SE(\bar{x}) = \bar{\bar{x}} + A_2\bar{R}$$

$$CL = E(\bar{x}) = \bar{\bar{x}}$$

$$LCL = E(\bar{x}) - 3SE(\bar{x}) = \bar{\bar{x}} - A_2\bar{R}$$

R-chart:-

Case i):- Standards are given then

$$UCL = D_1\sigma$$

$$CL = \bar{R}$$

$$LCL = D_2\sigma$$

Case ii) :- Standards are not given then

$$UCL = D_4\bar{R}$$

$$CL = \bar{R}$$

$$LCL = D_3\bar{R}$$

Teaching Plan / Lesson No.

Name of the Topic	Control chart for attributes
Hours required	
Learning Objectives	Limits of np chart, product & process Control
Previous knowledge to be reminded	Binomial distribution using this chart
Examples / Illustrations	Taking electrical switches on Boxes
Additional inputs	Giving the some other defnations of product & process Contro
Teaching Aids used	Black board
References cited	Quality, Reliabity & OR D.V.L.N. Jogiraju
Student Activity Planned after the teaching	preparation and Learning of Specifications limits, natural tolerance limits.
Activity planned outside the class room, if any	To solving the problems of np chart
Any other activity	To refer the old text books
Topic Synopsis	*(Continue on the reverse side if needed)* Control chart for d-chart:- It is alternative to p chart (or) the no of defective. we know that fraction of defectives is $p_i = \frac{d_i}{n}$ where $i = 1, 2, \ldots k$

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k = no. of subgroups

The 3σ control limits of d-chart are

$$UCL = E(d) + 3SE(d)$$

$$= np + 3\sqrt{npq} = np + 3\sqrt{np(1-p)}$$

$$CL = E(d) = np$$

$$LCL = E(d) - 3SE(d)$$

$$= np - 3\sqrt{npq}$$

$$LCL = np - 3\sqrt{np(1-p)}$$

Teaching Plan / Lesson No.

Name of the Topic	Control chart for attributes
Hours required	
Learning Objectives	C-chart & its applications, problems
Previous knowledge to be reminded	In this chart using poisson distribution
Examples / Illustrations	Aircrafts, cloth, bottles
Additional inputs	
Teaching Aids used	Blackboard
References cited	Quality, reliability & OR - D.V.L.N Jagaraju
Student Activity Planned after the teaching	Asking questions about the topic of C-chart & preparation
Activity planned outside the class room, if any	To Solving the problems of C-chart
Any other activity	Refer the books in library.
Topic Synopsis	*(Continue on the reverse side if needed)* Control charts for no. of defects per unit of C-chart The C-chart is design to control the no. of defects per unit. It is popular used in statistical work.

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Let c_i denote no. of defects in the ith sample unit ($i=1,2,\ldots,k$). c_i is poisson variate with parameter λ

i.e., $c \sim P(\lambda)$

We know that Mean $= E(c) = \lambda$

Variance $= V(c) = \lambda$

The 3σ control limits for c-chart are given by

$$U.C.L = E(c) + 3\sqrt{E(c)}$$

$$= \lambda + 3\sqrt{\lambda}$$

$$CL = E(c) = \lambda$$

$$L.C.L = E(c) - 3\sqrt{E(c)}$$

$$= \lambda - 3\sqrt{\lambda}$$

Semester-I

January 2021

Teaching Plan / Lesson No.

Name of the Topic	Introduction of statistics
Hours required	
Learning Objectives	Basics of statistics, Measures of central tendency Mean and its problems
Previous knowledge to be reminded	We are taking the history of statistics, and it is related to subject like social, Science.
Examples / Illustrations	Taking an example of birth registration, and death
Additional inputs	SEMINAR
Teaching Aids used	Blackboard, chalk and duster
References cited	FMS Text book – Gupta and Kapoor
Student Activity Planned after the teaching	preparation and learning, solving the problems
Activity planned outside the class room, if any	Solving the problems of Mean, Median
Any other activity	Refer the text books
Topic Synopsis	(Continue on the reverse side if needed) Measures of Central tendency :- the concentration of the given observation in the central part of the given data is called central tendency. Measure the concentration of the observation in the central part

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of the statistical data is known as Measure of central tendency. There are 5 types of averages in the central tendency.

1. Arithmetic mean
2. Geometric Mean
3. Median
4. Mode
5. Harmonic mean.

Teaching Plan / Lesson No.

Semester - III

Name of the Topic	Regression
Hours required	
Learning Objectives	Regression definition, Regression lines, problems, Regression co-efficients, Theorems of Regression vs Regression, Correlation
Previous knowledge to be reminded	Bivariate data, Concept of correlation, SLR line Estimation purpose, principle of least squares
Examples / Illustrations	Taking an example of Sales and purchase
Additional inputs	providing lab how to solve problems in Excel
Teaching Aids used	Blackboard, chalk and Duster
References cited	Statistical Methods & inference text book - S. Mahesh Rao
Student Activity Planned after the teaching	Assignment of Regression theorems
Activity planned outside the class room, if any	Solve the problems of Regression
Any other activity	Refer the textbooks in library
Topic Synopsis	(Continue on the reverse side if needed) → Regression:- The term regression literally means stepping back towards the average Definition:- Regression is a mathematical measure of the average relationship btw two (or) more variables in terms of the original units of data.

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The regression lines of both x and y are

$$(y-\bar{y}) = r\frac{\sigma_y}{\sigma_x}(x-\bar{x})$$

$$(x-\bar{x}) = r\frac{\sigma_x}{\sigma_y}(y-\bar{y})$$

(paper-V)
Semester-V

Teaching Plan / Lesson No.

Name of the Topic	Stratified random sampling
Hours required	
Learning Objectives	STRS allocations, Theorems of Stratified random sampling
Previous knowledge to be reminded	population, sample, sizes
Examples / Illustrations	Election of MP's from different states of India
Additional inputs	Revision
Teaching Aids used	Blackboard
References cited	Telugu academy textbook - Prof. K. Srinivasa Rao & Dr. K. Jagadish Reddy
Student Activity Planned after the teaching	preparation and learning about the STRS
Activity planned outside the class room, if any	write the some examples of stratified random sampling
Any other activity	Refer the books in library
Topic Synopsis	*(Continue on the reverse side if needed)* Stratified random sampling :- If a survey aims to study the cost of living in the state A.P In this case the sample data is to be collected from all income groups of people. Since population units are

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heterogeneous, one cannot assure that all the income groups like high, income, middle income group, low income group etc are equally represented into sample. If the sampling is done through the SRS. this can be assured by the technique stratified random sampling.

Teaching Plan / Lesson No.

Name of the Topic	Systematic Random Sampling
Hours required	
Learning Objectives	Systematic random sampling definition, Notations, Merits and Theorems
Previous knowledge to be reminded	population, sample are using in this Systematic random sampling
Examples / Illustrations	population, enquire about women's expense in advertisements, opinion from university girl students
Additional inputs	Quiz
Teaching Aids used	blackboard, chalk and Duster
References cited	Telugu Academy textbook - prof. K. Srinivasrao
Student Activity Planned after the teaching	Assignment of theorems of Sys
Activity planned outside the class room, if any	providing the theorems of Systematic random sampling
Any other activity	Refer the textbooks in library
Topic Synopsis	(Continue on the reverse side if needed) Systematic random Sampling:- If a Company want to conduct a survey about Marketing and introducing new product to the customers and there are 5000 customers in the city, then they

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are supposed to consider a sample of 100 customers for their survey. In this technique first we decide sampling ratio which is calculated.

for Eg:- $\frac{n}{N} = \frac{100}{5000} = \frac{1}{50}$. This decides sample interval which is 50 i.e., one customer is to be selected from every 50 customers.

(Paper-VI)
Semester-V

Teaching Plan / Lesson No.

Name of the Topic	Acceptance Sampling plans
Hours required	
Learning Objectives	Sampling inspection and 100% inspection, OC curve, definitions of ASP
Previous knowledge to be reminded	Taking Sampling Method of Statistics-III
Examples / Illustrations	factory, Industries, Bulbs, crackers, food products
Additional inputs	Asking Questions of that topic
Teaching Aids used	Blackboard
References cited	Quality, Reliability & OR - D.V.L.N Jagaraju, C. Sitala
Student Activity Planned after the teaching	Assignment of Sampling inspection.
Activity planned outside the class room, if any	write the examples of Sampling, 100% inspection.
Any other activity	Refer the textbooks in library.
Topic Synopsis	(Continue on the reverse side if needed) Acceptance Sampling:- To inspect Samples from a lot of articles is called Sampling inspection. In other words, Sampling inspection is a procedure to determine whether a lot of manufactured articles

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of the sample type from a repetitive process, should be accepted or rejected on the basis of the information supplied by random samples from the lot under consideration. It is also called the acceptance sampling.

Thus under sampling inspection plan a decision is taken about the acceptance or rejection of a lot 100% inspection we preferred the following cases

1. A defective item may cause danger to life
2. the lot size is small
3. The incoming quality is very poor

Teaching Plan / Lesson No.

Name of the Topic	Acceptance sampling plans
Hours required	
Learning Objectives	Types of sampling, Definitions, characteristics of oc curve
Previous knowledge to be reminded	Taking sample methods in statistics-III
Examples / Illustrations	finished goods in large factory
Additional inputs	SEMINAR
Teaching Aids used	Black board
References cited	Quality. & OR, Reliability - O.V.L.N Yogi Raju
Student Activity Planned after the teaching	Slip test
Activity planned outside the class room, if any	Write the examples of producer's risk, Consumer's risk
Any other activity	Refer the text book,
Topic Synopsis	*(Continue on the reverse side if needed)* Average Sample Number :- The expected Sample Size required to arrive at a decision about the acceptance or rejection of the lot under sampling inspection is known as Average sample number.

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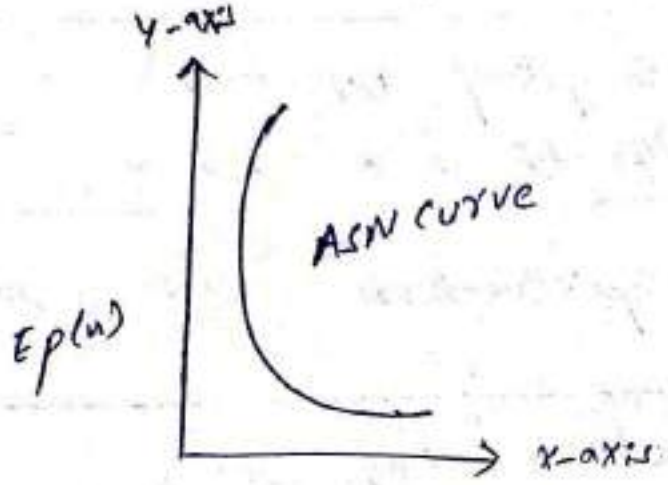
This depends on "p". The actual proportion of defectives is known as Average Sample Number curve.



February 2021
I Semester

Teaching Plan / Lesson No.

Name of the Topic	Mode, Median, Geometric mean, Harmonic mean
Hours required	
Learning Objectives	Step-deviation problems, Mode, Geometric mean, Harmonic mean & its problems
Previous knowledge to be reminded	In this topic we are using frequency distribution, Discrete data, Continuous data
Examples / Illustrations	Taking an examples of weights, average of intelligence of honesty of people, forecasting in the manufacture of steel
Additional inputs	Explaining how to find the rate of population growth, time, distance problems.
Teaching Aids used	Blackboard, chalk and Duster
References cited	Fundamental of statistic - Gupta & Kapoor
Student Activity Planned after the teaching	Preparation & learning
Activity planned outside the class room, if any	Solving the problems of H.M. G.M. Mode
Any other activity	Refer the textbooks
Topic Synopsis	*(Continue on the reverse side if needed)* → Mode defination, uses and its problems → Geometric mean and its problems → Harmonic mean and its problems Mode:- Mode is value of variable which occurs more frequently in the data. It is denoted by z

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Formula:- $Mode(z) = l + \left(\frac{f_0 - f_1}{2f_1 - f_0 - f_2}\right) \times c$ → Continuous series

Geometric mean:- The geometric mean of a set of 'n' positive observations is defined as the n^{th} root of product of 'n' observations

$$G.M = n(x_1 x_2 \ldots x_n)^{1/2}$$

Harmonic mean:- It is defined as the reciprocal of arithmetic mean and reciprocal of given observation

$$H.M = \frac{N}{\sum \frac{f_i}{x_i}}$$

Teaching Plan / Lesson No.

Semester - III

Name of the Topic	Attributes
Hours required	
Learning Objectives	order of class frequencies, consistency of data, Association of attributes, Yule's Coefficient
Previous knowledge to be reminded	Correlation, Regression and association, as well as to time series using statistical data, Characteristics
Examples / Illustrations	Drinking, Smoking, blindness, health, honesty etc., are the examples of attributes.
Additional inputs	Information about name, sex, nationality, literacy
Teaching Aids used	Blackboard, Chalk and Duster
References cited	FMS Text book - Gupta and Kapoor
Student Activity Planned after the teaching	Internal Exam
Activity planned outside the class room, if any	Solving the theorems of attributes
Any other activity	Refer the text books in library
Topic Synopsis	(Continue on the reverse side if needed) Attributes :- Literally, an attribute means quality (or) characteristic. Theory of attributes deals with qualitative characteristics which are not measurable as quantitative measurements. Hence need slightly different statistics

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treatment from that of the variables. Drinking, Smoking and blindness, health, honesty etc., are the examples of attributes.

Teaching Plan / Lesson No.

Semester-V

Name of the Topic	ANOVA
Hours required	
Learning Objectives	D.E definations, principle of DE. CRD, one way classification, Two way classification
Previous knowledge to be reminded	Taking an samples, Blocks, Yields, F table -values, f- distribution.
Examples / Illustrations	Examples of fields, fertilizers, plots, medicines
Additional inputs	SEMINAR
Teaching Aids used	Blackboard and chalk
References cited	FMS Text book - S.C. Gupta and Kapoor
Student Activity Planned after the teaching	Asking questions about the topic of ANOVA
Activity planned outside the class room, if any	Solve the problems of one way, Two way ANOVA Classification
Any other activity	Refer the books in a library
Topic Synopsis	*(Continue on the reverse side if needed)* ANOVA:- A powerful statistical tool, which splits the total variation in an experiment into components ascribable to different sources of variations. The ANOVA technique was introduced by R.A. fisher in 1920 and

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applied the same to the analysis of agronomical data

Assumptions of ANOVA :-

ANOVA technique can be applied to tests of significance of data only with the following assumptions.

1. All observations are independently with each other
2. The parent population from which the samples are drawn is always normal.
3. All observations are having the same unknown (ordinary) variance. This is known as assumption of homoscedasticity.

Teaching Plan / Lesson No.

Name of the Topic	RBD
Hours required	
Learning Objectives	RBD Defination, Assumptions, Statistical analysis of RBD, Efficiency of RBD over CRD
Previous knowledge to be reminded	Local Control, Experimental unit, treatments, Blocks and Randomization.
Examples / Illustrations	
Additional inputs	providing Computer lab how to calculate RBD in excel
Teaching Aids used	Blackboard and Chalk
References cited	FMS Text book - S.C.Gupta and Kapoor
Student Activity Planned after the teaching	Internal - II Exam
Activity planned outside the class room, if any	write the examples of RBD, Efficiency of RBD over CRD
Any other activity	Refer the books
Topic Synopsis	*(Continue on the reverse side if needed)* Randomized Block Design:- The treatments are allocated to each block in such a way that every treatment occurs once and only once each block in such a design is called RBD. RBD is a one restrictional design

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and it is simple to use in the field experimentation

Statistical analysis of RBD:-

The statistical analysis of RBD is similar to NOVA two way classification with single observation per cell. The linear statistical model for t-treatments and r-block is given below.

$$Y_{ij} = \mu + t_i + b_j + e_{ij}, \quad \begin{matrix} i = 1,2,\ldots,t \\ j = 1,2,\ldots,r \end{matrix}$$

Y_{ij} = yield from j^{th} block of i^{th} treatment

μ = General mean effect

t_i = i^{th} treatment effect

b_j = j^{th} block effect

e_{ij} = error effect i.e., $\epsilon_{ij} \overset{iid}{\sim} N(0, \sigma_e^2)$

Semester-V

paper-VI

Teaching Plan / Lesson No.

Name of the Topic	Sampling plans
Hours required	
Learning Objectives	Single Sampling plans & Double Sampling plans
Previous knowledge to be reminded	Taking Sample methods in Statistics - III
Examples / Illustrations	Finished goods in large factory
Additional inputs	providing example of Single & Double Sampling
Teaching Aids used	Blackboard
References cited	Quality, OR & reliability - Dr V.L.N Jogi Yasu, C.Sridhar
Student Activity Planned after the teaching	Asking questions about that topic and preparation.
Activity planned outside the class room, if any	Learning of SSP & DSP
Any other activity	Refer the text books
Topic Synopsis	*(Continue on the reverse side if needed)* → Introduction of SSP & DSP → Single Sampling plan and its notations → Double Sampling plan and its notations Single Sampling plan :- when the decisions about the acceptance (or) rejectance of a

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Tot is based on single sample. it is known as ssp.

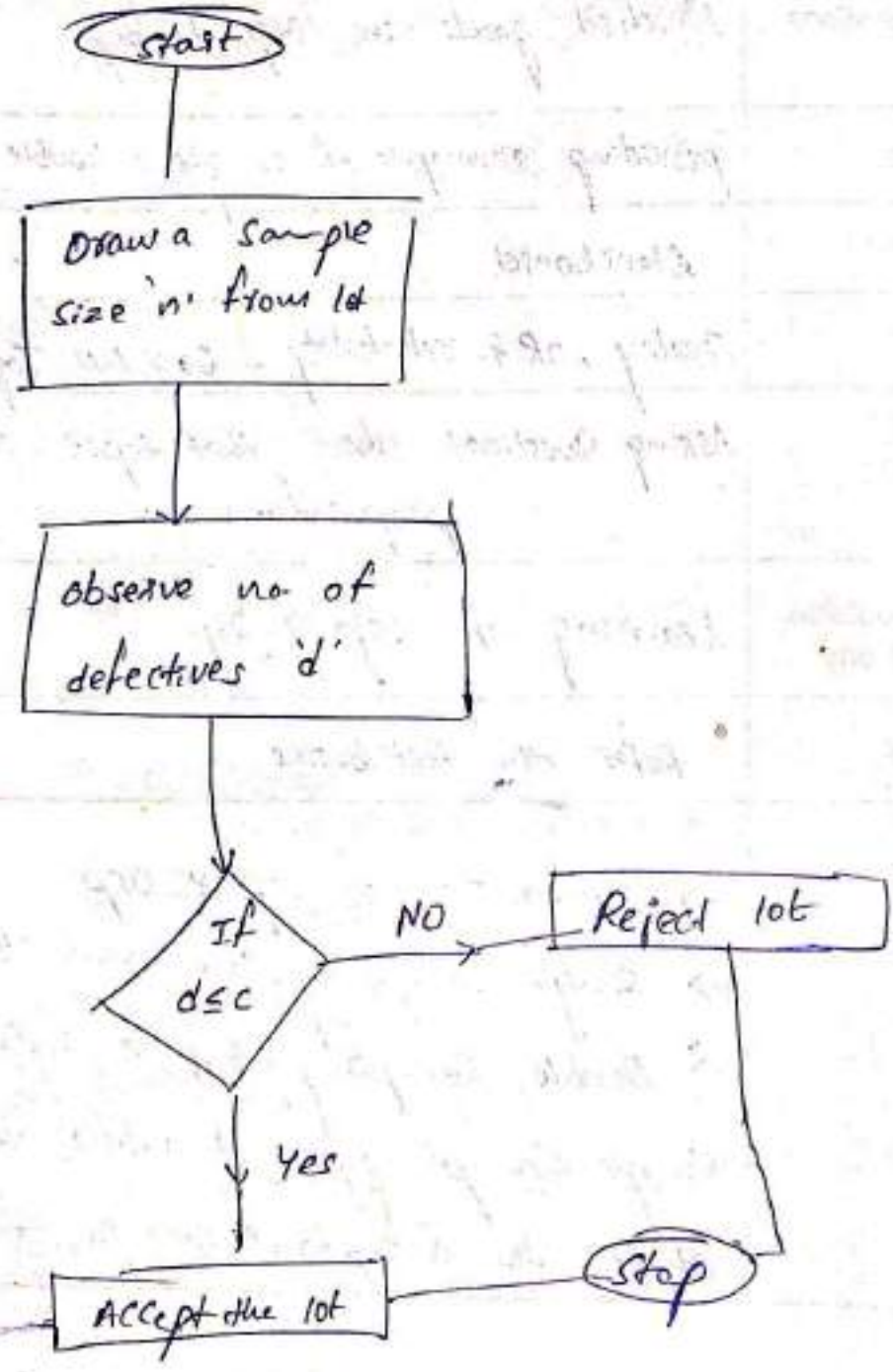
This plans involves 3 numbers namely.

N = the No. of units in the lot

n = the No. of units in the sample

c = Maximum allowable defective in the sample

Construction of single sampling plan :-



Teaching Plan / Lesson No.

Name of the Topic	SSp & Dsp
Hours required	
Learning Objectives	OC, ASN, ATI, AOQL of SSp & Dsp, producer's risk & consumer's risk of Dsp
Previous knowledge to be reminded	Taking an topic & diagram of OC curve
Examples / Illustrations	providing an example of SSp & Dsp
Additional inputs	SEMINAR
Teaching Aids used	Blackboard & chalk
References cited	Quality, QR & Reliability - D.V.L.N Jogiraju, C.Sarika
Student Activity Planned after the teaching	Internal - II Exam
Activity planned outside the class room, if any	preparation & learning
Any other activity	Refer the text books in library
Topic Synopsis	*(Continue on the reverse side if needed)* → OC of SSp & Dsp → ASN & ATI of SSp & Dsp → producer's & consumer's risk of Dsp ASN & ATI of SSp:- In a single sampling plan, the minimum no. of articles inspected

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Or, if, the remaining (N-n) articles are inspected only
for when the lot is rejected with a probability P_p. Let I
then denotes the average number of articles inspected
lot under $cs\rho$, then it is given by

$$I = n + (N-n) P_p.$$

for specified value of N, p we get equation with two unknown 'n' and c. It is better to find that pair values of n & c. which maximizes the expression I.

Semester - I

March 2021

Teaching Plan / Lesson No.

Name of the Topic	Measures of Dispersion, Distribution function
Hours required	15 hours
Learning Objectives	Dispersion definition, and it's measures like range, Q.D, S.D, M.D, Bivariate random variable, r.v problems, Bar diagram using Excel
Previous knowledge to be reminded	We are taking the large value, small value, fluctuations of sampling, Median, Mode, mean.
Examples / Illustrations	Taking an examples of fluctuations of Sampling
Additional inputs	Computer lab
Teaching Aids used	Black board, chalk and Duster
References cited	FMS text book - Gupta and Kapoor
Student Activity Planned after the teaching	Preparation and Learning
Activity planned outside the class room, if any	Write the other examples of dispersion measures
Any other activity	Refer the books in library
Topic Synopsis	(Continue on the reverse side if needed) → Dispersion measures → Bivariate random variable Measures of dispersion: The degree to which the numerical data tends to spread about tends an average value is called dispersion.

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There are 5 types of dispersion

1. Range
2. Quartile deviation
3. Mean deviation
4. Standard deviation
5. Co-efficient of variation

Bivariate data :- Random variables x, y is said to be a two dimensional discrete r.v's. It can take only a countable number of points on a two dimensional space. The random variable (x, y) is also said to be joint discrete random variables.

Eg :- Taking a coin is tossed with thrice and getting heads in tosses

ξ (HHH) (HHT) (HTH) (THH) (HTT) (TTH) (THT) (T

~~Paper-V~~
~~Sem-V~~

Teaching Plan / Lesson No.

Name of the Topic	Skewness and Kurtosis
Hours required	13 Hours
Learning Objectives	Skewness defination & its Types, problems, Sheppard's correction for moments.
Previous knowledge to be reminded	Using the class intervals, frequency, average, Median, Mode, frequency curve & its distribution.
Examples / Illustrations	Taking an example of household incomes in U.S
Additional inputs	providing lab for the practicals of statistics
Teaching Aids used	Black board, chalk and Duster
References cited	Fundamental Mathematical statistics book - Gupta & Kapoor
Student Activity Planned after the teaching	SEMINAR
Activity planned outside the class room, if any	Solving the problems of skewness
Any other activity	Refer the textbooks in library
Topic Synopsis	*(Continue on the reverse side if needed)* → Skewness defination & its Types, problems → Sheppard's correction for moments → Baye's theorem Sheppard's correction for moments :- In case of grouped frequency distribution

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While calculating moments we ~~achieved~~ assumed that the frequencies are constructed at the centre of the class intervals and if the distribution is symmetrical it is true, However the assumptions is not true in practice and some error called grouping errors into calculation of moments

$$\mu_2 (\text{corrected}) = \mu_2 (\text{uncorrected}) - \frac{h^2}{12}$$

$$\mu_3 (\text{corrected}) = \mu_3 (\text{uncorrected})$$

$$\mu_4 (\text{corrected}) = \mu_4 (\text{uncorrected}) - \frac{h^2}{12} \mu_2 (\text{uncorrected}) + \frac{7}{240} h^4$$

Here, h = width of class intervals

Paper - III
Semester - III

Teaching Plan / Lesson No.

Name of the Topic	Attributes
Hours required	15 hours
Learning Objectives	Order of class frequencies, Consistency of data, Association of attributes, Yule's co-efficient
Previous knowledge to be reminded	Correlation, regression and association, as well as to time series. using statistical data, characteristics.
Examples / Illustrations	Drinking, smoking, Blindness, health, honesty etc are the examples of attributes.
Additional inputs	Information about name, sex, nationality, literacy
Teaching Aids used	Black board, Chalk and Duster
References cited	TMH Text book - Gupta and Kapoor
Student Activity Planned after the teaching	Internal Exam
Activity planned outside the class room, if any	Solving the theorems of attributes
Any other activity	Refer the text books in library
Topic Synopsis	*(Continue on the reverse side if needed)* Attributes :- Literally, an attribute means quality (or) characteristic. Theory of attributes deals with qualitative characteristics which are not measurable as quantitative measurements. Hence need slightly different statistics

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treatment from that of the variables. Drinking, smoking and blindness, health, honesty etc, are the examples of attributes.

Teaching Plan / Lesson No.

Name of the Topic	Contigency
Hours required	9 hrs
Learning Objectives	Contigency defination and it's theorems, Consistency problems
Previous knowledge to be reminded	Classification, attributes, rows, Columns, Frequencies
Examples / Illustrations	An example of student reported the result of survey.
Additional inputs	Providing an information of Excel
Teaching Aids used	Blackboard, Chalk and Duster
References cited	Statistics Textbook - A. Mohan rao
Student Activity Planned after the teaching	Internal Exam
Activity planned outside the class room, if any	Prove theorems of contigency, consistency
Any other activity	Refer the textbooks in library
Topic Synopsis	*(Continue on the reverse side if needed)* Contigency table:- If there are n attributes with dichotomy there will be 2^n ultimate frequencies each represented by the combination of 'n' letters, capital (or) small. Thus the contigency table of order (2x2) for 2 attributes.

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A and B can be displayed as given below :

	A	α	Total
B	$(A \cap B)$	$(\alpha \cap B)$	(B)
β	$(A \cap \beta)$	$(\alpha \cap \beta)$	(β)
	(A)	(α)	N

Semester-V
Paper-V

Teaching Plan / Lesson No.

Name of the Topic	Experimental Designs
Hours required	17 hrs
Learning Objectives	LSD, Missing plot technique of LSD, Efficiency of LSD over RBD, 2^2, 2^3 factorial experiments
Previous knowledge to be reminded	using the principle of design of experiments like randomization, replication, local control
Examples / Illustrations	Taking an example of plots, fertilizers, Medicines, drugs
Additional inputs	Providing information about JAM exam
Teaching Aids used	Black board, Chalk and Duster
References cited	Telugu academy textbook - Dr. V. papaiah gastry
Student Activity Planned after the teaching	preparation
Activity planned outside the class room, if any	Write the example of LSD, RBD
Any other activity	Refer the books in library
Topic Synopsis	*(Continue on the reverse side if needed)* Latin Square Design :- Using any of below designs, be sure to randomize the treatment units and trial order, as much as the design allows. Eg:- One recommendation is that a latin Square design be randomly selected from

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those available, then randomize the run order

Layout :- An arrangement of conditions such that each combination occurs only once in each row and column of the test matrix

A	B	C	D
B	C	D	A
C	D	A	B
D	A	B	C

Sem-V
Paper-VI

Teaching Plan / Lesson No.

Name of the Topic	Reliability
Hours required	19 hrs
Learning Objectives	Reliability definition, advantages, Measures, failure rate, estimations of reliability
Previous knowledge to be reminded	using an situation of 2nd world war, quality estimations, government depts
Examples / Illustrations	Taking an example of electronic component, product, technology and automation.
Additional inputs	Explaining about statistics based govt. jobs
Teaching Aids used	Black board, Chalk & Duster
References cited	FMS Text book - S.C. Gupta & V.K. Kapoor
Student Activity Planned after the teaching	Slip test
Activity planned outside the class room, if any	Preparation and Learning
Any other activity	Refer the books in library
Topic Synopsis	*(Continue on the reverse side if needed)* Reliability :- The origin of the field of reliability theory can be traced back to the point at which man began to depend upon machines for livehood world war II raised curtain to many technological

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and management problems OR, SQC, Reliability theory evolved as solutions during world war II Complexity and automation of equipment used in the war resulted in problem of maintenance and repair. Hence the quantitative techniques are introduced to analyse the failure data.

The application of reliability principles gained importance in industries and government departments in almost all developed and developing countries during the last three decades.

April 2024

Teaching Plan / Lesson No. SEM - I

Name of the Topic	Spearmen rank correlation
Hours required	
Learning Objectives	Correlation ratio & it's theorems, Spearmen rank correlation, defination & it's problems, derivation.
Previous knowledge to be reminded	Taking the ranks, grades and correlation co-efficient.
Examples / Illustrations	Example of ranks of students in subsects scores of competitors in a beauty contest
Additional inputs	other information of correlation.
Teaching Aids used	Black board, Chalk and duster
References cited	Telugu academy text book - Dr. V. Papaiah sastry
Student Activity Planned after the teaching	Preparation and learning
Activity planned outside the class room, if any	Solving the problems of Spearmen rank correlation.
Any other activity	Refer the related books of correlation.
Topic Synopsis	*(Continue on the reverse side if needed)* ⇒ Spearmenk rank correlation, defination ⇒ Correlation ratio Spearmen rank correlation: It was developed by British psychologist charles edward spearmen in 1904. It is denoted as P. Pearson

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Co-efficient of correlation between ranks of X's and Y's is called the rank correlation co-efficient between A and B. The formula is defined as

$$\rho = 1 - \left[\frac{6 \Sigma_i d_i^2}{n(n^2-1)} \right]$$

where $d_i = x_i - y_i$ = difference between two ranks.

Paper-IV
Sem-IV

Teaching Plan / Lesson No.

Name of the Topic	Estimation
Hours required	
Learning Objectives	Estimation introduction, Criteria of good estimator, unbiased theorems, Consistency theorems.
Previous knowledge to be reminded	Mean, variance, population correlation coefficient, probability
Examples / Illustrations	If the example of value $\hat{\mu} \in [2.5, 3.5]$ then the interval 2.5, 3.5 is the interval estimates of μ
Additional inputs	Providing the information about excel
Teaching Aids used	Black board, chalk and Duster
References cited	FMS text book - S.C Gupta and V.K. kapoor
Student Activity Planned after the teaching	Assignment
Activity planned outside the class room, if any	Prove the theorems of unbiasedness, consistency
Any other activity	Refer the related books of estimation
Topic Synopsis	*(Continue on the reverse side if needed)* → Estimator, Estimation definition → Criteria of good estimator → Consistency, unbiased theorems Estimation:- The theory of estimation was founded by prof R.A Fisher in 1930

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and theory of hypothesis was indicated by J. Neyman E.S pearson in 1930.

Estimators of parameters like mean, variance, population correlation co-efficient from the corresponding sample statistics is one of the important problems of statistical inference.

Teaching Plan / Lesson No.

Name of the Topic	Sufficiency, M.L.E, Method of moments
Hours required	
Learning Objectives	Sufficiency definition & it's problems, MLE & it's applications of MLE, N-F theorem, Method of moments
Previous knowledge to be reminded	Parameters, estimate, conditional distribution Distributions like binomial, poisson, Normal
Examples / Illustrations	Let $x_1, x_2 \ldots x_n$ be a random sample from bernoulie population with parameter 'p' $0<p<1$, $x_i = \begin{cases} 1 & \text{with prob } p \\ 0 & \text{with prob } 1-p \end{cases}$
Additional inputs	Explaining these topics in the applications of distribution.
Teaching Aids used	Blackboard, chalk and Duster
References cited	EMS Textbook - S.C Gupta and V.K. Kapoor
Student Activity Planned after the teaching	Internal - Exam
Activity planned outside the class room, if any	Solve the problems of sufficiency, MLE, method of moments.
Any other activity	Refer the textbooks in library
Topic Synopsis	*(Continue on the reverse side if needed)* Sufficiency :- An estimator is said to be sufficient a parameter if it contains all the information in the sample regarding the parameter. More precisely if $T = t(x_1, x_2, \ldots x_n)$ is an estimator if a parameter θ based on sample $x_1, x_2 \ldots x_n$

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of size n from the population with density $f(x, \theta)$ such that the conditional distribution of $x_1, x_2 \ldots x_n$ given T is independent of θ then T is sufficient estimator for θ.

Teaching Plan / Lesson No.

Sem - VI

Name of the Topic	Time Series
Hours required	
Learning Objectives	Time Series defination, Components of time Series additive & Multiplicative models.
Previous knowledge to be reminded	Variations, It is used in weather forecasting earthquake, finance, econometrics, Trend.
Examples / Illustrations	Example of time Series are heights of ocean tides, industrial, Agricultural production.
Additional inputs	Providing information about statistical Institutions
Teaching Aids used	Black board, Chalk and Duster
References cited	Telugu academy textbook - Dr. V Rapaiah Reddy
Student Activity Planned after the teaching	Slip test
Activity planned outside the class room, if any	write the examples of Time series, components of time Series.
Any other activity	Refer the related books of estimation
Topic Synopsis	*(Continue on the reverse side if needed)* Time series defination:- A time series is a sequence of observation of data points measured over a time interval

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May 2021
Sem-IV

Teaching Plan / Lesson No.

Name of the Topic	MVUE and Hypothesis C.I
Hours required	
Learning Objectives	MVUE defination and its theorems, problems, C.I, Hypothesis definations & its problems
Previous knowledge to be reminded	population, Sample, statements, decissions like accepting (or) rejecting errors.
Examples / Illustrations	i) Launch the new product (ii) Don't launch the new product are the examples of hypothesis
Additional inputs	providing other information of hypothesis
Teaching Aids used	Black board, Duster and chalk
References cited	statistical methods & Intermie textbook - S.C. Gupta
Student Activity Planned after the teaching	Preparation and learning
Activity planned outside the class room, if any	Write the examples of hypothesis.
Any other activity	Refer the books in library
Topic Synopsis	*(Continue on the reverse side if needed)* Statistical test of hypothesis :- The theory of testing parametric statistical hypothesis was developed by J. Neymann in 1928 Hypothesis :- A statement about population is known as hypothesis

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Statistical Hypothesis :- A statement about population interms of population parameter(s) is known as statistical hypothesis and denoted by H. In entire testing of hypothesis, a hypothesis mean it is a statistical hypothesis.

Null Hypothesis :- According to fisher, a hypothesis of no difference is called H_0.

Eg :- $H_0 : \mu = \mu_0$

Sample has drawn from same population.

Teaching Plan / Lesson No.

Name of the Topic	N-P Lemma and large sample test
Hours required	
Learning Objectives	N-P Lemma theorem & its applications like in B.D, P.D, N.D, Large sample test for single mean.
Previous knowledge to be reminded	Null hypothesis, Alternative hypothesis, likelihood functions, critical region, Sample size, sample population.
Examples / Illustrations	Examples of mean score of students, life time of bulbs.
Additional inputs	providing another examples of LS T is Dice, coins
Teaching Aids used	Black board, chalk and Dusters
References cited	Statistical methods & inference Textbook
Student Activity Planned after the teaching	SEMINAR
Activity planned outside the class room, if any	Learning of N-P Lemma theorem
Any other activity	Refer the books in library
Topic Synopsis	*(Continue on the reverse side if needed)* Large sample test:- The sample of size 'n' $n \geq 30$ is called large sample. The test procedure based on the sample is called large sample test.

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Basic steps involved in large Sample theory

The following steps are to be followed in the tests of Significance in large Sample theory.

1. We set up the null hypothesis H_0
2. Setup the Alternative hypothesis H_1 either one tailed (or) two tailed tests.
3. Select the appropriate level of Significance 'α' eg either 1% (or) 5%
4. Compute test statistics under H_0 eg

$$Z = \frac{t - E(t)}{V(t)} \quad N \; N(0,1)$$

Compare the calculated value of Z with critical values (or) table values at α% LOS

Paper-I
Sem-I

Teaching Plan / Lesson No.

Name of the Topic	Correlation
Hours required	
Learning Objectives	Correlation definition & it's properties & also its Measures
Previous knowledge to be reminded	Here we are taking logarithm, linear relationship btn two (or) more variables
Examples / Illustrations	Taking an example of population estimation in Years, income, expenditure of a family
Additional inputs	Explaining another examples of correlation
Teaching Aids used	Black board, chalk, Dusters
References cited	Statistical methods & inference-Telugu academy
Student Activity Planned after the teaching	Learning the method's of curves
Activity planned outside the class room, if any	Solving the problems of ~~exponential~~ correlation, power curve.
Any other activity	Refers the textbook.
Topic Synopsis	(Continue on the reverse side if needed) -> Correlation:- It is used as a statistical measure the relationship between the variables. In the correlation one variable will be changes another variables also automatically changes. There are 3 types of correlation

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1. Positive correlation
2. Negative "
3. Zero "

Zero correlation :- The relationship b/w the two variables is zero the type of correlation is called zero correlation

Eg:- Student marks and their heights

Positive correlation :- When two variables are said to be correlated that means if one variable will be increases automatically another variable also increase i.e; two variables move in the same direction the type of correlation is called positive correlation

#

Teaching Plan / Lesson No.

Name of the Topic	Spearmen's rank Correlation
Hours required	
Learning Objectives	Correlation ratio & its theorems, Spearmen rank correlation, Definition & its problems
Previous knowledge to be reminded	Taking the ranks, grades and Correlation Coefficient
Examples / Illustrations	Examples of ranks of students in subjects, scores of competitors in a beauty contest.
Additional inputs	other information of correlation
Teaching Aids used	Blackboard, chalk and duster
References cited	Telugu academy text book - Dr. papaiahsastry
Student Activity Planned after the teaching	preparation and learning
Activity planned outside the class room, if any	solving the problems of spearmen rank correlation
Any other activity	Refer the related books of correlation
Topic Synopsis	*(Continue on the reverse side if needed)* Spearmen rank Correlation:- It was developed by british psychologist. Charles edward Spearmen in 1904. It is denoted by ρ. Coefficient of Correlation b/n ranks of x's and y's is called the Rank Correlation

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Coefficient between A & B. the formula is defined as

$$\rho = 1 - \left[\frac{6 \Sigma d_i^2}{n(n^2-1)} \right]$$

where $d_i = x_i - y_i$ = difference btw two ranks

Teaching Plan / Lesson No.

Name of the Topic	Regression
Hours required	
Learning Objectives	Regression defination, Regression lines, problems of Regression coefficients, theorems of Rc.
Previous knowledge to be reminded	Bivariate data, Concept of Correlation, principle of least squares
Examples / Illustrations	Taking an example of sales and purchase
Additional inputs	providing lab how to solve problems in excel
Teaching Aids used	Blackboard, chalk and Duster
References cited	statistical Methods & inference text book - A. Mohan
Student Activity Planned after the teaching	Assignment of Regression theorems
Activity planned outside the class room, if any	Solve the problems of Regressions
Any other activity	Refer the text books in library
Topic Synopsis	*(Continue on the reverse side if needed)* → Introduction of Regression and its defination → Regression lines, Regression coefficients → Theorems of Regression, correlation vs Regression Regression:- the term Regression literally

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means stepping back towards the average

Definition:- Regression is a mathematical measure of the average relationship btw two (or) more variables interms of the original units of data.

The regression lines of both x and y are

$$(y-\bar{y}) = r\frac{\sigma_y}{\sigma_x}(x-\bar{x})$$

$$(x-\bar{x}) = r\frac{\sigma_x}{\sigma_y}(y-\bar{y})$$

Teaching Plan / Lesson No.

Name of the Topic	Attributes
Hours required	
Learning Objectives	Order of class frequencies, consistency of data, Association of attributes, Yule's Coefficient
Previous knowledge to be reminded	Correlation, regression and association, as well as to time series using statistical data, characteristics
Examples / Illustrations	Drinking, smoking, blindness, health, honesty are the examples of attributes.
Additional inputs	Information about name, sex, nationality, literacy.
Teaching Aids used	Blackboard, Chalk and Duster
References cited	FMS Text book - Gupta and Kapoor
Student Activity Planned after the teaching	Internal Exam
Activity planned outside the class room, if any	Solving the theorems of attributes
Any other activity	Refer the text books in library
Topic Synopsis	(Continue on the reverse side if needed) Attributes :- Literally, an attribute means quality or characteristic. Theory of attributes deals with qualitative characteristics which are not measurable as quantitative measurements. Hence need slightly different.

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statistics treatment for that of the variables. Drinking, smoking and blindness, health, honesty etc. are the examples of attributes.

Paper-VI
Sem - VI

Teaching Plan / Lesson No.

Name of the Topic	Measurement of trend
Hours required	
Learning Objectives	Types of trend - Graphical Method, Method of Semi averages, Curve fitting, Moving averages Method
Previous knowledge to be reminded	Taking straight line, second degree parabola, averages, graphs using in Curve fitting
Examples / Illustrations	examples of sales & production output, population estimations
Additional inputs	How to protice the straight line, second degree parabola by using excel
Teaching Aids used	Blackboard, chalk and Duster
References cited	FMS text book - S.C. Gupta and V.K. kapoor
Student Activity Planned after the teaching	Assignment
Activity planned outside the class room, if any	Solve the problems of Curve fitting
Any other activity	Refer the books in library
Topic Synopsis	(Continue on the reverse side if needed) Measurement of trend :- 1. Graphical Method 2. Method of semi-averages 3. Curve fitting by using least squares 4. Method of Moving averages

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Method of least squares :

Let the straight line $y_t = a + bt \rightarrow (1)$

the sum of squares of residuals $R = \sum (y_t - a - bt)^2 \rightarrow (2)$

p.d.w.r to a & b in (2)

$$\frac{\partial R}{\partial a} = 0 \Rightarrow \sum y_t = na + b\sum t \rightarrow (3)$$

$$\frac{\partial R}{\partial b} = 0 \Rightarrow \sum t y_t = a\sum t + b\sum t^2 \rightarrow (4)$$

Solve (3) & (4) are normal equations we get the estimated values a, b

$\therefore$ the fitted straight line equation is

$$\hat{y}_t = \hat{a} + \hat{b}t$$

Teaching Plan / Lesson No.

Name of the Topic	Methods of seasonal variations
Hours required	
Learning Objectives	Simple Average method, Ratio to Moving avg method, Ratio to trend method, Link Relative method, and its merits, demerits, problems.
Previous knowledge to be reminded	Using Mean, percentage, various variations, Straight line, Second degree parabola
Examples / Illustrations	Examples of sales of textiles, crops.
Additional inputs	providing information how to use these methods in real life
Teaching Aids used	Blackboard, chalk and Duster
References cited	FMS Text book - S.C. Gupta & V.K. Kapoor
Student Activity Planned after the teaching	Internal Exam
Activity planned outside the class room, if any	Solve the problems of seasonal variations
Any other activity	Refer the books in library
Topic Synopsis	(Continue on the reverse side if needed) Methods for Measuring seasonal variations 1. Simple average method 2. Ratio to moving average method 3. Ratio to trend method 4. Link Relative method

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JUNE 2021 Sem-I
Paper-I

Teaching Plan / Lesson No.

Name of the Topic	probability
Hours required	
Learning Objectives	Basic Concepts of probability and some definitions and its Methods, theorems
Previous knowledge to be reminded	Taking only real life examples like Coins, Cards, die and using experiment, trial definitions
Examples / Illustrations	Examples of coins, cards, dice and success & failure
Additional inputs	Explaining how to use statistics in real life
Teaching Aids used	Blackboard, chalk & Duster
References cited	Fundamental of Mathematical statistics - Gupta & Kapoor
Student Activity Planned after the teaching	preparation and learning
Activity planned outside the class room, if any	learning the methods of probability
Any other activity	Refers the text books in library
Topic Synopsis	*(Continue on the reverse side if needed)* → Basics of probability → Method & theorems of probability probability:- It refers chance. Total probability is equal to "0". Trail:- An experiment is known as Trail

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Outcome:- Result of an experiment is known as event or cases.

Eg:- Drawing 2 cards from a pack of well shuffled cards is a trail and getting of a king and queen are events.

There are three methods of probability

1. Mathematical definition of probability
2. Statistical approach of probability
3. Axiomatic approach of probability

Teaching Plan / Lesson No.

Name of the Topic	Random Variable
Hours required	
Learning Objectives	Joint, Marginal, Conditional distributions, Discrete, Continuous random variables pdf & pmf
Previous knowledge to be reminded	we are using the bivariate random variable, Total probability is always equal to 1 Condition
Examples / Illustrations	Taking an example of Coins
Additional inputs	providing information how to use random variable in life
Teaching Aids used	Blackboard and chalk, Duster
References cited	Telugu academy text book - A. Mohan rao
Student Activity Planned after the teaching	Asking Questions about the topic of probability
Activity planned outside the class room, if any	Solving the problems of Discrete, Continuous random variables.
Any other activity	Refer the text books in library
Topic Synopsis	(Continue on the reverse side if needed) → Random variable definition → problems of discrete, Continuous r.v → Joint, Marginal, Conditional distributions → Bivariate random variable. Random variable definition:- A random variable usually written x, is a variable whose

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possible values are numerical outcomes of a random experiment. There are two types of random variables discrete and variable.

Discrete random variable:- A random variable takes finite values.

Eg:- 1. No. of phone calls in a particular time.

2 No. of stars in the sky

Continuous random variable:- A random variable takes integral values btn interval.

Eg:- Age, weight, height of population.

Teaching Plan / Lesson No.

Name of the Topic	Independence random variable
Hours required	
Learning Objectives	Marginal distributions (density), conditional density functions. Independence random variable,
Previous knowledge to be reminded	we are using the bi-variate random variable, total probability is always = 1 (condition)
Examples / Illustrations	Taking an examples of dice, coin, cards, (in real life)
Additional inputs	providing information how to use statistics
Teaching Aids used	Black board, chalk and Duster
References cited	Telugu academy, text book - A. Mohanrao
Student Activity Planned after the teaching	Asking questions about the topic of probability
Activity planned outside the class room, if any	Solving the problems of independence random variable
Any other activity	Refer the text books in library
Topic Synopsis	*(Continue on the reverse side if needed)* → Independent random variable definition → problems of I.R.V → Conditional probability, Marginal distribution, Joint probability distribution functions

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Conditional distributions :- for two dimensional random variable (x, y). the joint distribution function $F_{xy}(x,y)$ - for any real numbers x and y is given by

$$F_{xy}(x,y) = P(x \le x,\ y \le y)$$

using conditional probabilities we may now write.

$$F_{xy}(x,y) = \int_{-\infty}^{x} P(y \le y / x = x)\ dF_x(x)$$

$$F_{y/x}(y/x) = P(y \le y / x = x) = P[A / x = x]$$

Name of the Topic	least Squares method
Hours required	
Learning Objectives	fitting of straight line; fitting of parabola, power curve, exponential curve and also using these curves in excel
Previous knowledge to be reminded	Using equations like $y = ax+b$, $y = ax^2+bx+c$, $y = ax^b$, $y = ae^{bx}$ (or) ab^x
Examples / Illustrations	An example of charts like scatter chart, using curve
Additional inputs	providing information of population education methods
Teaching Aids used	Black board, chalk and Duster
References cited	statistics text book – A. Mohan rao
Student Activity Planned after the teaching	Revision
Activity planned outside the class room, if any	Solve the problems
Any other activity	Refer the books in library
Topic Synopsis	(Continue on the reverse side if needed) Fitting of straight line :- Let the straight line $U_t = a+b$ where U_t is the time series; $a, b,$ Constants. principle of least squares Co

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Minimizing the sum of squares of the deviations between the given values of u_t.

$R = \sum (u_t - a - bt)^2$ is minimum $\rightarrow$ (2)

D.w.r to 'a', b and equating to zero we get

$$\frac{\partial R}{\partial a} = 0 \Rightarrow \frac{\partial}{\partial a} \sum (u_t - a - bt)^2 = 0$$

$$\Rightarrow 2 \sum (u_t - a - bt)^{2-1} = 0$$

$$\Rightarrow \sum u_t = na + b \sum t \rightarrow (3)$$

$$\frac{\partial R}{\partial b} = 0 \Rightarrow \sum t u_t = a \sum t + b \sum t^2 \rightarrow (4)$$

These (3) & (4) are normal equations

Solving these equations then we get estimated values of a & b. Sub $\hat{a}, \hat{b}$ in eq (1)

$\therefore$ the fitted st. line equations is $\hat{u} = \hat{a} + \hat{b}t$

Teaching Plan / Lesson No.

Name of the Topic	Index numbers
Hours required	
Learning Objectives	Index numbers definitions & Types of I.N, simple weighted I.N, CLIN, Ideal I.N, Construction of I.N
Previous knowledge to be reminded	Taking any example of production of items & index meaning, A.M, H.M, G.M formulas
Examples / Illustrations	production of items, stock Market situations, Cost of living in different cites
Additional inputs	Assignment
Teaching Aids used	Black board
References cited	Telugu academy text book - prof K. Srinivasa Rao
Student Activity Planned after the teaching	preparation & learning
Activity planned outside the class room, if any	Solving the problems of S.I, W.I, CLIN, Ideal I.N
Any other activity	Refer the books in library
Topic Synopsis	*(Continue on the reverse side if needed)* → Introduction of index numbers & its definitions → Simple index numbers, CLIN, W.I.N Cost of living index numbers :- Cost of living index numbers are constructed to study the effect of changes in the prices and

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quantities of commodities (variables) in the current year to the effect of reference to the base year.

1. Aggregate expenditure Method:-

$$CLIN = \frac{\Sigma P_1 q_0}{\Sigma P_0 q_0} \times 100$$

2. Family Budget Method:-

$$CLIN = \frac{\Sigma IN}{\Sigma W}$$

$$W = P_0 q_0$$

$$I = \frac{P_1}{P_0} \times 100$$

Semester-IV

Teaching Plan / Lesson No.

Name of the Topic	Large Sample test
Hours required	
Learning Objectives	L-test for two proportions, S.d's, Correlation, variance, L-test for 2 Means, two S.d's
Previous knowledge to be reminded	The no. of trails almost all the distributions like binomial, poisson, Normal distribution
Examples / Illustrations	Examples of surveys on patients, opinions on Construction, coins, dice problems on Excel
Additional inputs	providing the information how to solve Statistics
Teaching Aids used	Blackboard, chalk and duster
References cited	Statistical methods & inference text book - mohan rao
Student Activity Planned after the teaching	preparation and learning
Activity planned outside the class room, if any	Solving the problems of 2 Means, S.d's, Correlation, variance
Any other activity	Refer the books in library
Topic Synopsis	*(Continue on the reverse side if needed)* → Large Sample test for 2 means, Correlation → L-test for two S.d's, Variance, Large sample test for single proportion. Sinle sample size 'n' is large and x &

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no. of success in 'n' independent trail with probability

'p' of success for each trail.

$E(x) = np$ and $V(x) = npq$ where $q = 1 - p$

It has been proved that if n is large, B.D tends to N.D

Hence $x \sim N(np, npq)$

then test statistics is $z = \frac{x - E(x)}{\sqrt{V(x)}} = \frac{x - np}{\sqrt{npq}} \sim N(0,1)$

$|z|$ calculated value $\geq z$ table value at 5% LOS

then we reject H_0 otherwise we accept H_0.

Teaching Plan / Lesson No.

Name of the Topic	~~Large~~ Small Sample test for single Means & Correlation
Hours required	
Learning Objectives	t-test for Single & two means & its problems, t-test for Correlation Coefficients & its problems
Previous knowledge to be reminded	using Means, Correlation, standard normal variate, Sample size
Examples / Illustrations	Taking an examples of students I.B levels, Marks
Additional inputs	providing lab how to use statistics in excel
Teaching Aids used	Blackboard, chalk & Duster
References cited	EMS text book - S.C. Gupta & Kapoor
Student Activity Planned after the teaching	Solving the problems of Means
Activity planned outside the class room, if any	Solving the problems of Correlation
Any other activity	Refer the books in library
Topic Synopsis	(Continue on the reverse side if needed) Small sample test:- If the sample size is less than 30 then that samples are small samples. the statistical tests where the sample size less than 30 are called small sample tests.

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Test for Single Correlation Coefficient:-

Let r be the correlation coefficient of sample size 'n' p of observation from a bi-variate population

$H_0: \rho = 0$

there is no significance of correlation in population.

The test statistic under H_0 is as follows

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \sim t_{(n-1)}$$

If Calculated value $\leq$ t-table value

so, we accept H_0 otherwise we reject H_0