

Digambarrao Bindu Arts Commerce & Science College, Bhokar, Dist Nanded

Annual Teaching Plan for 2017-2018

Department of Statistics

Work Distribution

Teachers		Class	
Dr. M.R. Fegade	Mr. S. E. Chavan	Mr. T. V. Navghare	
Theory	Practical	Theory	Practical
Paper-I	Paper-III	Paper-II	Paper-IV
B.Sc. I	Sem.-I	B.Sc. II	Sem.-II
B.Sc. I	Sem.-I	B.Sc. II	Sem.-III
Paper-VI	Paper-VIII	Paper-VI	Paper-IV
B.Sc. II	Sem.-IV	B.Sc. II	Sem.-IV
B.Sc. III	Sem.-V	B.Sc. III	Sem.-V
Paper-XII	Paper-XIV	Paper-XII	Paper-XV
B.Sc. III	Sem.-VI	B.Sc. III	Sem.-VI
Paper-X	Paper-X	Paper-VII	Paper-IX
Paper-XVI	Paper-XVI	Paper-XIII	Paper-XV
Paper-XI	Paper-XI	Paper-XI	Paper-XVII
Paper-XIII	Paper-XIII	Paper-XIII	Paper-XVIII



Dr. Mahesh R. Fegade
Head
Department of Statistics
Digambarrao Bindu ACS College, Bhokar

Principal
Digambarrao Bindu Arts, Com. & Sci. College
Bhokar, Tq. Bhokar Dist. Nanded



Class: B.SC-S.Y
 Title of the Paper & No.: Practical - II Paper no.- X
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2017-18

Month	Course content	Expected Periods
June	Revision:	
July	Fitting of Normal distribution, Problems based on area property of Normal distribution, Chi-square test for population variance	12
Aug	Chi-square test for goodness of fit, Chi-square test for 2x2 contingency table also using Yates correction for Independence of attributes	12
Sept	Chi-square test of Homogeneity of Correlation coefficients, t-Test for single mean	12
Oct		
Nov		
Dec	t - Test for difference of means, Paired t - test, t - Test for testing the significance of sample correlation coefficient, F-Test for equality of two population variances	12
Jan	Estimation by method of moments, Estimation by method maximum likelihood estimation, Construction of confidence interval for mean and proportion, Large sample test for single mean	12
Feb	Large sample test for difference of means, Large sample test for single proportions, Large sample test for difference of proportions	09
March	Revision	
April		

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Month	Course content	Expected Periods
June	Revision:	
July	<p>Unit I - Uniform and Exponential Distribution:-</p> <p>(i) Rectangular or Uniform distribution: Definition, Moments, Moment generating function, Mean, Variance, Mean deviation about mean, examples, problems and application, Relation with other distributions, Properties of Rectangular distribution. Distributions of distribution function of continuous random variable.</p> <p>(ii) Exponential Distribution: - Probability density function, Moment Generating function, Mean and Variance, lack of memory property, problems, Relation between exponential distribution and uniform distribution.</p> <p>Unit-II-Normal Distribution:-</p> <p>Probability density function, Normal Distribution as a limiting form of Binomial Distribution Important characteristics of Normal Distribution and Normal Probability curve,</p> <p>Mode, Median, Quartiles, Moment Generating Function and Cumulant Generating Function, Moments, Additive property for Linear combination of two independent normal variables, Mean deviation about mean, Area property (Normal probability integral), Importance of normal distribution, fitting of normal distribution, Use of Normal Probability plot</p> <p>Unit III:-Gamma Distributions-</p> <p>Gamma Distribution with single and two parameters, Moment Generating Function, Cumulant Generating Function, limiting form of Gamma Distribution, properties of Gamma Distribution, Beta Distribution of first and second kind, Moments of Beta Distributions, Relation between Exponential and Gamma Distribution as a sum of i.i.d. exponential random variables, Problems, examples, Applications, Transformation of one & Two Dimensional random variables.</p>	14
Aug	<p>Unit IV: - Weibull and Cauchy Distribution: -</p> <p>(i) Weibull Distribution:-Probability Density Function of Weibull Distribution with given shape and scale, parameter, Moments of standard Weibull Distribution, Characteristics of Weibull distribution</p> <p>(iii) Cauchy Distribution:- Probability density function of Cauchy Distribution, Characteristics of standard Cauchy Distribution, Comment on non existence, moments of standard Cauchy Distribution</p>	14
Sept	<p>Unit V: Logistic Distribution: - Central Limit theorem, Application of central limit theorem, Probability density function of Cauchy Distribution</p>	12
Oct	<p>Unit V: Logistic Distribution: - Central Limit theorem, Application of central limit theorem, Probability density function of</p>	05

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Nov	Logistic distribution, moment generating function of Logistic distribution, problems, De-Moivre, Laplace Theorem.	
Dec	Unit I:-Chi-square Distribution :- Chi-Square variate, Derivation of Chi-Square Distribution (Using method of moment generating function), Nature of Chi-Square probability curve, moment generating function, Cumulant Generating Function, limiting form of Chi-Square Distribution for large Degrees of Freedom, Moments, Mode and Skewness of Chi-Square Distribution, Additive property of Chi-Square Distribution	12
Jan	Unit II:-Applications of Chi-square distribution:- Chi-square Distribution for Testing of Hypotheses (i) Population variance (ii) goodness of fit (iii) Test of independence of attributes, contingency table, Yates correction for 2x2 contingency table (iv) Homogeneity of three or more correlation Coefficients, Problems Unit III: - t - Distribution:- Students' t statistic, Derivation of student's t distribution, Fisher's t, Distribution of Fisher's t, moments of t-distribution, limiting form of t-distribution, graph of t-distribution.	14
Feb	Applications of t - distribution for testing of hypothesis: (1) t-test for single mean, (2) t-test for difference of means (paired & unpaired), (3) t-test correlation coefficient, problem Unit-IV:-F- Distribution:- F-Statistic, Probability density function, moments of F-distribution, mode of F-distribution, F- test for equality of two variances, Relation between F & t- distribution, F and Chi-Square Distribution, problem	14
March	Unit-V:-Fisher's Z -Distribution:- Probability density function of Fisher's Z Distribution, Moment generating function of Z- distribution, Fisher's Z Transformation, problems	05
April		



Class: B.S.C-T.Y
 Title of the Paper & No.: Practical - V Paper no.- XVII
 Name of the Teacher: Dr. M. R. Fegade

Month	Course content	Expected Periods
June	Revision:	03
July	Drawing Simple Random Sample, Estimation of population mean using SRS, Estimation of Variance using SRS, Estimation of population mean and variance Using different allocations in Stratified random sampling, Estimation of gain in precision due to stratification, Determination of sample size in stratified sampling,	12
Aug	Estimation of population mean and variance In systematic sampling, ANOVA one way classification	12
Sept		
Oct		
Nov		
Dec	ANOVA two way classification with one entry per cell, Analysis of Completely Randomized Design, Analysis of Randomized Block Design	12
Jan	Analysis of Latin Square Design, Missing plot Technique of RBD, Missing plot Technique of LSD	12
Feb	Efficiency of LSD over RBD, 2^2 Factorial Experiment, 2^3 Factorial Experiment	12
March	Revision	
April		03

ANNUAL TEACHING PLAN 2017-18

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DEPARTMENT OF STATISTICS

B. SC-T.Y

Title of the Paper & No.: Survey Sampling- XII & Design of Experiments- XIV

Name of the Teacher: Dr. M.R. FEGADE



ANNUAL TEACHING PLAN 2017-18

Month	Course content	Expected Periods
June	Unit-I- Sample Survey:-Concepts of population and sample, sampling unit, sampling frame, Parameters and statistics, sampling Distribution,	04
July	Principle steps in Sample Survey, Principles of Sample Survey, sampling and non sampling errors, advantages of sampling over complete census, Limitations of sampling. Unit-II-Types of sampling, Random and Non random sampling, Methods of achieving randomness, sample size, Determination of sample size, Purposive Sampling, Probability Sampling, and Snow ball Sampling, Quota Sampling, Mixed Sampling.	12
Aug	Unit-III- Simple random sampling with and without replacement, probability of selecting any specified unit in the sample, selection of simple random sample, Notation and terminology, Estimation of population mean and its standard error, Simple Random sampling of attributes, merits and demerits simple random sampling	12
Sept	Unit-IV- Concept of stratification, Stratified Random sampling: sampling from heterogeneous population, Notation and terminology, Allocation of sample size, Proportional Allocation, Neyman Allocation, Estimation of population mean and its variance with under each allocation and their comparison, Proportional allocation Vs simple random sampling, Gain in precision due to stratification	12
Oct	Unit-V-Systematic sampling, sampling Interval, Notation and terminology, Variance of Estimated means, relation between Systematic sampling and Simple Random sampling, Merits and Demerits of Systematic sampling, Condition for systematic sampling to be better than SRS.	05
Nov		
Dec	Unit-I-Analysis of variance: Introduction, One way, two way classification with one observation per cell, Analysis of two way classified data with one observation per cell, Mathematical Model, ANOVA table, Degrees of freedom Hypotheses to be tested. Unit-II- Design of Experiments:- Introduction, Notation and terminology, Principles of an Experimental Design, Replication, Randomization, Local control	12
Jan	size of plot, Analysis of Completely Randomized Design (CRD). Unit-III- Randomized Block Design (RBD), Statistical analysis of RBD for one observation per experimental unit, Comparison of CRD with RBD in terms of efficiency, Missing value in RBD.	14

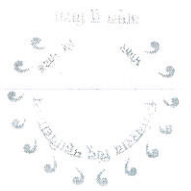
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Feb.	Unit-IV- Latin Square Design: Analysis of Latin Square Design, Advantages and disadvantages of Latin Square Design, efficiency of LSD compared with CRD and RBD, Missing value in LSD.	12
March	Unit-V- Factorial Experiments: Factorial Experiment purpose, need, advantages of factorial Experiments, Analysis of 2^2 and 2^3 Factorial Experiments, Yates correction method of computing factorial effect total, ANOVA table.	07
April		



Class: B.S.C-F.Y
 Title of the Paper & No.: Practical - I Paper no.- V
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2017-18

Month	Course content	Expected Periods
June	Revision:	
July	Construction of Frequency distributions, Diagrammatic representation of data, Graphical representation of data	12
Aug	Measures of central tendencies, Construction of partition values, Compute measures of dispersions and coefficient of variation	12
Sept	Computation of Moments, Skewness and kurtosis, Karl person's correlation coefficient, Spearman's rank correlation coefficient	12
Oct		
Nov.		
Dec	Fitting of linear Regression, Fitting of Binomial distribution, Fitting of Poisson distribution,	12
Jan	Fitting of Curves (i) $Y=ab^x$ (ii) Second degree curve, Attributes	12
Feb	Computation of probabilities of bivariate distribution, Most Plausible values of system of linear equations	09
March		
April		

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Class: B.S.C-F.Y
Title of the Paper & No: Elementary Probability Theory-I & Discrete Probability Distributions-III

Name of the Teacher: Dr. M.R. Fegade

ANNUAL TEACHING PLAN 2017-18

Month	Course content	Expected Periods
June		
July	<p>Unit-I - Probability: Deterministic and non-deterministic experiments or Random experiment, trial, out come and event, types of events: Simple, composite, mutually exclusive Exhaustive events, Independent events, sample space, classical definition of probability, Empirical definition of probability, Axiomatic approach to probability, Addition theorem of probability, Extension of addition theorem of probability (up to 3 events), Conditional probability and pair wise independent events, multiplication theorem of probability for independent finite events, Baye's theorem, Baye's theorem for further events.</p> <p>Unit-II: - Random Variable (Univariate):- Random Variable, Distribution function and its properties, discrete random variable</p>	12
Aug.	<p>Probability mass function, distribution function of discrete random variable, Continuous random variable, Probability density function, distribution function of continuous random variable, properties of distributions (continuous and discrete)</p> <p>Unit III: Random Variable (Bivariate) Definition, Probability mass function of two dimensional, marginal probability function, conditional probability function, two dimensional distribution function, marginal distribution function joint density function, marginal density function, stochastic independence and related theorems.</p> <p>Unit IV: Mathematical Expectations: Definition, Expected value of random Variable, Expected value of Function of random variable properties of Expectations, Various measures of Central Tendency, Dispersion, skewness and Kurtosis for Discrete and continuous probability distribution, Basic concepts, Variance, Properties of variance, covariance, Variance of a Linear combination of Random variable, conditional expectations</p>	14
Sept	<p>Definition, Expected value of random Variable, Expected value of Function of random variable properties of Expectations, Various measures of Central Tendency, Dispersion, skewness and Kurtosis for Discrete and continuous probability distribution, Basic concepts, Variance, Properties of variance, covariance, Variance of a Linear combination of Random variable, conditional expectations</p>	14
Oct	<p>Unit -V: Probability Generating function:- Moment Generating Function- Definition, Properties of moment generating function, Cumulants, cumulant generating function properties of cumulants problems.</p>	05
Nov		
Dec	<p>Unit I: Uniform Distribution: (i) Uniform discrete distribution: - Definition, Mean, Variance and Moment Generating Function, Examples on real life situation.</p> <p>Unit II: Binomial Distribution:</p>	14

	(ii) Bernoulli distribution: Definition, Mean, Variance and moment generating function, examples on real life situation. (iii) Binomial Distribution: Definition, Moments, moment generating function, cumulants, additive property of Binomial distribution, recurrence relation for the probabilities of Binomial distribution, Mode, Examples on real life situation.	
Jan	Unit III: Poisson distribution: - Poisson distribution as a limiting case of Binomial distribution, moments of Poisson distribution, mode of Poisson distribution, recurrence relation for moment of Poisson distribution, moment generating and cumulant generating function, additive property of Poisson distribution, recurrence formula for the probabilities of Poisson distribution.	14
Feb	Unit IV: Negative Binomial and Geometric distribution: - (i) Definition, moment generating function, cumulants, moments, Relation between negative binomial and binomial distribution. (ii) Geometric distribution: definition, lack of memory, moments of geometric distribution, moment generating function, mean, variance, Applications of geometric distribution in the real life situation.	12
March	Unit V: Hyper geometric distribution: - (1) Hyper geometric Distribution: Definition, Mean and variance, relation with Binomial distribution, Recurrence relation for the probabilities of hyper geometric distribution, Examples on real life.	05
April		

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Annual Teaching Plan for 2018-2019

Department of Statistics

Work Distribution

Class		Dr. M.R. Fegade		Mr. S. E. Chavan		Miss. S P. Deshmukh	
B.Sc. I	Sem.-I	Theory	Paper-I	Paper-V	Theory	Practical	Theory
B.Sc. I	Sem.-I	Paper-I	Paper-III				Paper-II
B.Sc. I	Sem.-II	Paper-III	Paper-VI	Paper-X	Paper-VII	Paper-VIII	Paper-III
B.Sc. II	Sem.-III						
B.Sc. II	Sem.-IV	Paper-VIII	Paper-X	Paper-VII	Paper-VIII	Paper-XI	Paper-III
B.Sc. II	Sem.-IV	Paper-VIII					
B.Sc. III	Sem.-V	Paper-XIII	Paper-XVII	Paper-XII	Paper-XIV	Paper-XIV	Paper-III
B.Sc. III	Sem.-V	Paper-XIII					Paper-XII
B.Sc. III	Sem.-VI	Paper-XV	Paper-XVII	Paper-XII	Paper-XIV	Paper-XIV	Paper-XIV
B.Sc. III	Sem.-VI	Paper-XV					Paper-XII

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DEPARTMENT OF STATISTICS



Class: B.SC-FY
 Title of the Paper & No.: Practical - I Paper no.- V
 Name of the Teacher: Dr. M. R. Fegade

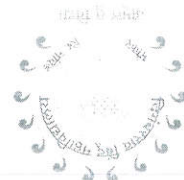
ANNUAL TEACHING PLAN 2018-19

Month	Course content	Expected Periods
June	Revision:	
July	Construction of Frequency distributions, Diagrammatic representation of data, Graphical representation of data	12
Aug	Measures of central tendencies, Construction of partition values, Compute measures of dispersions and coefficient of variation	12
Sept	Computation of Moments, Skewness and kurtosis, Karl person's correlation coefficient, Spearman's rank correlation coefficient	12
Oct		
Nov		
Dec	Fitting of linear Regression, Fitting of Binomial distribution, Fitting of Poisson distribution,	12
Jan	Fitting of Curves (i) $Y=ab^x$ (ii) Second degree curve, Attributes	12
Feb	Computation of probabilities of bivariate distribution, Most Plausible values of system of linear equations	09
March		
April		

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Class:

B.SC-FY

Title of the Paper & No.: Descriptive Statistics and Computing –II & Theory of variables and Attributes- IV

Name of the Teacher: Dr. M.R. Fegade

ANNUAL TEACHING PLAN 2018-19

Month	Course content	Expected Periods
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June		
July	<p>Unit I: - Basic Statistics and Data Condensation: Meaning of statistics, Importance and scope of Statistics, Statistical Organizations in India and their functions, Types of data: Primary and secondary data. Scales of measurement of variables: Nominal, Ordinal, Ratio and Interval. Frequency distributions (continuous and discrete), Presentation of data, Graphical presentation of data by histogram, Frequency curve, Frequency polygon, Ogives, Stem and Leaf Chart. Diagrammatic presentation of data: Bar chart, multiple bar charts, pie chart.</p>	12

Aug	<p>Unit –II:- Measures of Central Tendency: Measures of central tendency Arithmetic mean (simple and weighted and Trimmed mean), Combined mean, Geometric Mean, Harmonic Mean, Median, Mode, Derivation of Median formula for frequency distribution, Quartiles, Box Plot, Calculating quartiles by analytical and graphical method, Uses of Mean, Median, Mode, Harmonic Mean, Geometric Mean, Relation between means, Merits and demerits of measures of central tendency.</p>	14
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Sept	<p>Unit - III Measures of Dispersion: Concepts of measures of dispersion, Types of measures of dispersion, Range, Quartile Deviation, Mean absolute deviation about mean, median, mode, Standard deviation, Variance, Root mean square deviation, Properties of variance, relation between variation.</p> <p>Unit IV: - Moments: Raw and central moments, moments about arbitrary point, Relation between raw moments and central Moments (Up to 4th order), Effect of change of origin and scale on moments, Sheppard's Correction for central moments, Pearson's coefficients, Measures of skewness, kurtosis.</p>	14
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Oct	<p>Unit V: -Statistical Computing Using Excel:- Graphical & Diagrammatic presentation of data, Computation of various measures of central tendency, dispersion, skewness and kurtosis, moments using ms-excel.</p>	05
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Nov		
Dec	<p>Unit-I: - Bivariate data and Correlation: Graphical method to represents bivariate data, scatter diagram</p> <p>Unit-II:- Correlation: Concept of correlation, Karl persons' product moment correlation and its properties, independence and un co relatedness, Spearman rank correlation coefficient and its properties, derivation of rank</p>	13

Department of Statistics

Annual Teaching plan 2018-19

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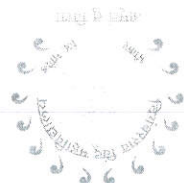
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	correlation coefficient formula.	
Jan	<p>Unit -III: Linear Regression: - Regression coefficients, coefficient of determination, lines of regression and their properties, properties of regression coefficients, derivation of lines of regression, residuals and their properties, residuals plot.</p> <p>Unit -IV:-Fitting of curves:- Legendre's principle of least squares, fitting of straight line, Second degree curve and Exponential curve, Power curve</p> <p>, Logistic curve $y = k/1+Exp(a + b x)$, interpretation of Regression coefficients, most plausible solution of system of liner equations.</p>	14
Feb	<p>Unit: V:- Theory of Attributes:- Concepts of attributes, Notation, Classification using dichotomy, class frequency, order of classes, positive and negative class frequencies, ultimate class frequencies, relation between class frequencies, consistency of attributes, (up to three attributes)</p>	12
March	<p>independence and association of two attributes, Yule's coefficient of association Q. Coefficient of colligation V. Relation between them.</p>	06
April		



Class: B.Sc-S.Y
 Title of the Paper & No.: Practical - II Paper no.- X
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2018-19

Month	Course content	Expected Periods
June	Revision:	
July	Fitting of Normal distribution, Problems based on area property of Normal distribution, Chi-square test for population variance	12
Aug	Chi-square test for goodness of fit, Chi-square test for 2x2 contingency table also using Yates correction for Independence of attributes	12
Sept	Chi-square test of Homogeneity of Correlation coefficients, t-Test for single mean	12
Oct		
Nov		
Dec	t - Test for difference of means, Paired t - test, t - Test for testing the significance of sample correlation coefficient, F-Test for equality of two population variances	12
Jan	Estimation by method of moments, Estimation by method maximum likelihood estimation, Construction of confidence interval for mean and proportion, Large sample test for single mean	12
Feb	Large sample test for difference of means, Large sample test for single proportions, Large sample test for difference of proportions	09
March	Revision	
April		

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Class

: BSC-S.Y

Title of the Paper & No.: Continuous Probability Distributions-VI & Exact Sampling Distributions-VIII

Name of the Teacher:

Dr.M. R. Fegade

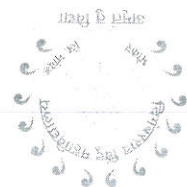
ANNUAL TEACHING PLAN 2018-19

Month	Course content	Expected Periods
June	Revision:	
July	<p>Unit I :- Uniform and Exponential Distribution:- i) Rectangular or Uniform distribution: Definition, Moments, Moment generating function, Mean, Variance, Mean deviation about mean, examples, problems and application, Relation with other distributions, Properties of Rectangular distribution. Distributions of distribution function of continuous random variable. ii) Exponential Distribution: - Probability density function, Moment Generating function, Mean and Variance, lack of memory property, problems, Relation between exponential distribution and uniform distribution. Unit-II-Normal Distribution:- Probability density function, Normal Distribution as a limiting form of Binomial Distribution Important characteristics of Normal Distribution and Normal Probability curve.</p>	14
Aug	<p>Gamma Distribution with single and two parameters, Moment Generating Function, Cumulant Generating Function, limiting form of Gamma Distribution, properties of Gamma Distribution, Beta Distribution of first and second kind, Moments of Beta Distributions, Relation between Exponential and Gamma Distribution as a sum of i.i.d. exponential random variables, Problems, examples, Applications, Transformation of one & Two Dimensional random variables.</p>	14
Sept	<p>Unit IV :- Weibull and Cauchy Distribution :- (i) Weibull Distribution:-Probability Density Function of Weibull Distribution with given shape and scale, parameter, Moments of standard Weibull Distribution, Characteristics of Weibull distribution (ii) Cauchy Distribution:- Probability density function of Cauchy Distribution, Characteristics of standard Cauchy Distribution, Comment on non existence, moments of standard Cauchy Distribution</p>	12
Oct	<p>Unit V: Logistic Distribution: - Central Limit theorem, Application of central limit theorem, Probability density function of Logistic distribution, moment generating function of Logistic distribution, problems, De-Moivre, Lapalce Theorem.</p>	05

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Nov	Unit I:-Chi-square Distribution - Chi-Square variate, Derivation of Chi-Square Distribution (Using method of moment generating function), Nature of Chi-Square probability curve, moment generating function, Cumulant Generating Function, limiting form of Chi- Square Distribution for large Degrees of Freedom Moments, Mode and Skewness of Chi- Square Distribution, Additive property of Chi-Square Distribution
Dec	Unit II:-Applications of Chi-square distribution:- Chi-square Distribution for Testing of Hypotheses (i) Population variance (ii) goodness of fit (iii) Test of independence of attributes, contingency table, Yates correction for 2x2 contingency table (iv) Homogeneity of three or more correlation Coefficients, Problems Unit III: - t- Distribution:- Student's t statistic, Derivation of student's t distribution, Fisher's t, Distribution of Fisher's t, moments of t- distribution, limiting form of t-distribution, graph of t- distribution.
Jan	Applications of t - distribution for testing of hypotheses:- (1) t-test for single mean, (2) t-test for difference of means (paired & unpaired), (3) t-test correlation coefficient, problem Unit-IV:-F- Distribution:- F- Statistic, Probability density function, moments of F- distribution, mode of F- distribution, F- test for equality of two variances, Relation between F & t- distribution, F and Chi-Square Distribution, problem Unit-V:-Fisher's Z -Distribution:-
Feb,	Probability density function of Fisher's Z Distribution, Moment generating function of Z- distribution, Fisher's Z Transformation, problems
March	05
April	14
	14
	12



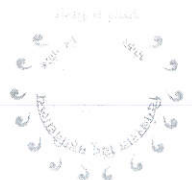
Class: B.S.C-T.Y
 Title of the Paper & No.: Practical - V Paper no.- XVII
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2018-19

Month	Course content	Expected Periods
June	Revision:	
July	Formulation of Linear Programming Problem, Solution of L.P.P. by Graphical method, Basic feasible solution of L.P.P., Solution of L.P.P. by Simplex method,	12
Aug	Solution of L.P.P. by Big-M method, Assignment problem, North- West Corner Rule method, Matrix Minima method,	12
Sept	Vogel's Approximation Method, Optimality test, Unbalanced Transportation problem,	12
Oct		
Nov		
Dec	Game with and without Saddle point	06
Jan	Graphical method to solve $2 \times n$ and $m \times 2$ Game, Dominance Property, Sequencing, Queuing	12
Feb	Simulation Traveling salesman problem, PERT, CPM	12
March	Revision	02
April		

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Class: B. SC-T.Y.
 Title of the Paper & No.: Linear Programming- (XIII -B₁) & Operations Research- (XV -B₁)
 Name of the Teacher: Dr. M.R. FEGADE

ANNUAL TEACHING PLAN 2018-19

Month	Course content	Expected Periods
June	Unit-I-Basics of operations Research: Introduction, scope, definition of operations research, Objectives of operations research, Phases of operations research, scope of operations research, Limitations of operations research.	05
July	Unit-II-Linear Programming Problem: Introduction, General Linear Programming problems, Mathematical Formulation of L.P.P., Basic solution, Non degenerate and Degenerate Basic solution, Important Thermo's Important Definitions, Convex set and Thermo's on it. Unit-III- Solution of L.P.P. by Graphical Method, Slack and surplus variables, some definitions and Notations. Fundamental Theorems of L.P.P (Only statement).	12
Aug	Basic Feasible Solution from feasible solution, Simplex Method of L.P.P, artificial variables, Big-M method, Numerical problems Unit- IV - Assignment problem: Introduction, Assignment problem, Mathematical Formulation of an Assignment problem, Unbalanced Assignment Problem, method for solving a minimal Assignment problem (Hungarian Method)	12
Sept	Unit-V-Transportation problem: Introduction, Difference between Transportation problem and Assignment problem, Important definitions, solution of Transportation problem, Initial feasible solution, North-West corner rule method, Lowest-cost entry method, Vogel's approximation method, Optimality test.	12
Oct	computational procedure of Optimality test (Modified Distribution method), Resolving Degeneracy in Transportation problem, unbalanced Transportation problem	04
Nov		
Dec	Unit-I- Sequencing problem: Introduction, Sequencing problem ,General Assumptions, Sequencing Decision problem for n-jobs on two Machines Traveling salesmen problem, solution of Traveling salesmen problem. Unit II:-Concept of Queue, Introduction to Queuing Theory, Queue Discipline, Inter time arrival distribution, service time distribution waiting time	12
Jan	Unit-III-Game Theory, Introduction, Competitive game, Finite and Infinite Game, Zero-sum game, Two Person Zero-sum game, Payoff Matrix, Strategy, Solution of a game, value of a game, Saddle point, Solution of a rectangular game with Saddle point, Solution of 2 x 2 game without Saddle point, Dominance Property, Graphical Method for the, Solution of 2 x n and m x 2 games.	14

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April		
March	Unit V - Critical path, Float of an activity and Event, Probability consideration in PERT, Distinguish between PERT and CPM.	07
Feb	Unit-IV-Network Analysis: Introduction, Network and basic components, Activity, Event, logical sequencing, Rules for network construction, Critical path analysis Forward pass calculation, Backward pass calculation.	12

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Annual Teaching Plan for 2019-2020

Department of Statistics

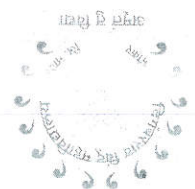
Work Distribution

Class		Dr. M.R. Fegade		Miss. R S. Shinde		Miss. S. B. Rathod	
B.Sc. I	Sem.-I	Theory	Paper-I	Theory	Paper-II	Theory	Paper-II
B.Sc. I	Sem.-I	Practical		Practical		Practical	
B.Sc. I	Sem.-II		Paper-III				Paper-IV
B.Sc. II	Sem.-III		Paper-VI				
B.Sc. II	Sem.-IV		Paper-VIII				
B.Sc. III	Sem.-V		Paper-XIII				
B.Sc. III	Sem.-VI		Paper-XV				
Paper-XVII		Paper-X	Paper-V	Paper-VII	Paper-XI	Paper-XIV	Paper-XII
				Paper-VIII			Paper-XIII
Paper-XVI		Paper-XIV	Paper-XII	Paper-XI	Paper-XIV	Paper-XVI	Paper-XIII
							Paper-XV

Head
Dr. Madhav R. Fegade
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Class: B.SC-F.Y
 Title of the Paper & No.: Practical - I Paper no.- V
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2019-20

Month	Course content	Expected Periods
June	Revision:	
July	Construction of Frequency distributions, Diagrammatic representation of data, Graphical representation of data	12
Aug	Measures of central tendencies, Construction of partition values, Compute measures of dispersions and coefficient of variation	12
Sept	Computation of Moments, Skewness and kurtosis, Karl person's correlation coefficient, Spearman's rank correlation coefficient	12
Oct		
Nov		
Dec	Fitting of linear Regression, Fitting of Binomial distribution, Fitting of Poisson distribution,	12
Jan	Fitting of Curves (i) $Y=ab^x$ (ii) Second degree curve, Attributes	12
Feb	Computation of probabilities of bivariate distribution, Most Plausible values of system of linear equations	09
March		
April		

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Class:

B.SC-F.Y

Title of the Paper & No.: Descriptive Statistics and Computing -I & Theory of variables and Attributes- IV

Name of the Teacher: Dr. M.R. Fegade

ANNUAL TEACHING PLAN 2019-20

Month	Course content	Expected Periods
June		
July	<p>Unit I: - Basic Statistics and Data Condensation: Meaning of statistics, Importance and scope of Statistics, Statistical Organizations in India and their functions, Types of data: Primary, and secondary data. Scales of measurement of variables: Nominal, Ordinal, Ratio and Interval. Frequency distributions (continuous and discrete), Presentation of data, Graphical presentation of data by histogram, Frequency curve, Frequency polygon, Ogives, Stem and Leaf Chart. Diagrammatic presentation of data: Bar chart, multiple bar charts, pie chart.</p>	12
Aug	<p>Unit -II:- Measures of Central Tendency: Measures of central tendency Arithmetic mean (simple and weighted and Trimmed mean), Combined mean, Geometric Mean, Harmonic Mean, Median, Mode, Derivation of Median formula for frequency distribution, Quartiles, Box Plot, Calculating quartiles by analytical and graphical method, Uses of Mean, Median, Mode, Harmonic Mean, Geometric Mean, Relation between means, Merits and demerits of measures of central tendency.</p>	14
Sept	<p>Unit - III Measures of Dispersion: Concepts of measures of dispersion, Types of measures of dispersion, Range, Quartile Deviation, Mean absolute deviation about mean, median, mode, Standard deviation, Variance, Root mean square deviation, Properties of variance, relation between Root mean square deviation and Standard deviation, Coefficient of variation.</p> <p>Unit IV: - Moments: Raw and central moments, moments about arbitrary point, Relation between raw moments and central Moments (Up to 4th order), Effect of change of origin and scale on moments, Sheppard's Correction for central moments, Pearson's coefficients, Measures of skewness, kurtosis.</p>	14
Oct	<p>Unit V: -Statistical Computing Using Excel:- Graphical & Diagrammatic presentation of data, Computation of various measures of central tendency, dispersion, skewness and kurtosis, moments using ms-excel.</p>	05
Nov		
Dec	<p>Unit:- Bivariate data and Correlation: Graphical method to represents bivariate data, scatter diagram, concept of correlation, Karl persons' product moment correlation and its properties, independence and un co relatedness, Spearman rank correlation coefficient and its properties, derivation of rank correlation coefficient formula.</p>	12

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	<p>Unit -II: Linear Regression: - Regression coefficients, coefficient of determination, lines of regression and their properties, properties of regression coefficients, derivation of lines of regression, residuals and their properties, residuals plot.</p> <p>Unit -III:-Fitting of curves:- Legendre's principle of least squares, fitting of straight line, Second degree curve and Exponential curve, Power curve, Logistic curve $y = k/(1+Exp(a+ b x))$, interpretation of Regression coefficients, most plausible solution of system of liner equations.</p>	Jan	14
	<p>Unit: IV:- Theory of Attributes:- Concepts of attributes, Notation, Classification using dichotomy, class frequency, order of classes, positive and negative class frequencies, ultimate class frequencies, relation between class frequencies, consistency of attributes, (up to three attributes) independence and association of two attributes, Yule's coefficient of association Q. Coefficient of colligation V. Relation between them.</p>	Feb	14
	<p>Unit: V: Computation using Excel: Computation of Karl person's correlation coefficient, Spearman rank correlation coefficient, fitting of regression line, curves. Decide the best fit using R^2 with the help of ms-excel.</p>	March	05
		April	



Class: B.SC-S.Y
 Title of the Paper & No.: Practical – II Paper no.- X
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2019-20

Month	Course content	Expected Periods
June	Revision:	
July	Fitting of Normal distribution, Problems based on area property of Normal distribution, Chi-square test for population variance	12
Aug	Chi-square test for goodness of fit, Chi-square test for 2x2 contingency table also using Yates correction for independence of attributes	12
Sept	Chi-square test of Homogeneity of Correlation coefficients, t-Test for single mean	12
Oct		
Nov		
Dec	t - Test for difference of means, Paired t - test, t - Test for testing the significance of sample correlation coefficient, F-Test for equality of two population variances	12
Jan	Estimation by method of moments, Estimation by method maximum likelihood estimation, Construction of confidence interval for mean and proportion, Large sample test for single mean	12
Feb	Large sample test for difference of means, Large sample test for single proportions, Large sample test for difference of proportions	09
March	Revision	
April		

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Class : B.SC-S.Y

Title of the Paper & No.: Continuous Probability Distributions-VI & Exact Sampling Distributions-VIII

Name of the Teacher: Dr.M.R.Fegade

ANNUAL TEACHING PLAN 2019-20

Month	Course content	Expected Periods
June	Revision:	
July	<p>Unit I - Uniform and Exponential Distribution:- i) Rectangular or Uniform distribution: Definition, Moments, Moment generating function, Mean, Variance, Mean deviation about mean, examples, problems and application, Relation with other distributions, Properties of Rectangular distribution. Distributions of distribution function of continuous random variable. ii) Exponential Distribution: - Probability density function, Moment Generating function, Mean and Variance, lack of memory property, problems, Relation between exponential distribution and uniform distribution. Unit-II- Normal Distribution:- Probability density function, Normal Distribution as a limiting form of Binomial Distribution Important characteristics of Normal Distribution and Normal Probability curve.</p>	14
Aug	<p>Mode, Median, Quartiles, Moment Generating Function and Cumulant Generating Function, Moments, Additive property for Linear combination of two independent normal variables, Mean deviation about mean, Area property (Normal probability integral), Importance of normal distribution, fitting of normal distribution, Use of Normal Probability plot Unit III:-Gamma Distributions- Gamma Distribution with single and two parameters, Moment Generating Function, Cumulant Generating Function, limiting form of Gamma Distribution, properties of Gamma Distribution, Beta Distribution of first and second kind, Moments of Beta Distributions, Relation between Exponential and Gamma Distribution as a sum of i.i.d. exponential random variables, Problems, examples, Applications, Transformation of one & Two Dimensional random variables.</p>	14
Sept	<p>Unit IV :- Weibull and Cauchy Distribution:- (i) Weibull Distribution:-Probability Density Function of Weibull Distribution with given shape and scale, parameter, Moments of standard Weibull Distribution, Characteristics of Weibull distribution Cauchy Distribution:- Probability density function of Cauchy Distribution, Characteristics of standard Cauchy Distribution, Comment on non existence, moments of standard Cauchy Distribution</p>	12
Oct	<p>Unit V : Logistic Distribution:- Central Limit theorem, Application of central limit theorem, Probability density function of Logistic distribution, moment generating function of Logistic distribution, problems, De-Moivre, Laplace Theorem.</p>	05

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Nov		
Dec	12	<p>Unit I:-Chi-square Distribution - Chi-Square variate, Derivation of Chi-Square Distribution (Using method of moment generating function), Nature of Chi-Square probability curve, moment generating function, Cumulant Generating Function, limiting form of Chi- Square Distribution for large Degrees of Freedom Moments, Mode and Skewness of Chi- Square Distribution, Additive property of Chi-Square Distribution</p>
Jan	14	<p>Unit II:-Applications of Chi-square distribution:- Chi-square Distribution for Testing of Hypotheses (i) Population variance (ii) goodness of fit (iii) Test of independence of attributes, contingency table, Yates correction for 2x2 contingency table (iv) Homogeneity of three or more correlation Coefficients, Problems Unit III: - t- Distribution:- Students' t statistic, Derivation of student's t distribution, Fisher's t, Distribution of Fisher's t, moments of t- distribution, limiting form of t-distribution, graph of t- distribution.</p>
Feb	14	<p>Unit-IV:-F- Distribution:- Applications of t - distribution for testing of hypothesis, (1)t-test for single mean, (2) t-test for difference of means (paired & unpaired), (3) t-test correlation coefficient, problem F- Statistic, Probability density function, moments of F- distribution, mode of F- distribution, F- test for equality of two variances, Relation between F & t- distribution, F and Chi-Square Distribution, problem</p>
March	05	<p>Unit-V:-Fisher's Z -Distribution:- Probability density function of Fisher's Z Distribution, Moment generating function of Z- distribution, Fisher's Z Transformation, problems</p>
April		



Class: B.S.C-T.Y
 Title of the Paper & No.: Practical – V Paper no.- XVII
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2019-20

Month	Course content	Expected Periods
June	Revision:	
July	Formulation of Linear Programming Problem, Solution of L.P.P. by Graphical method, Basic feasible solution of L.P.P., Solution of L.P.P. by Simplex method,	12
Aug	Solution of L.P.P. by Big-M method, Assignment problem, North-West Corner Rule method, Matrix Minima method,	12
Sept	Vogel's Approximation Method, Optimality test, Unbalanced Transportation problem,	12
Oct		
Nov		
Dec	Game with and without Saddle point, Graphical method to solve $2 \times n$ and $m \times 2$ Game, Dominance Property, Sequencing	12
Jan	Queuing, Simulation Traveling salesman problem	9
Feb.	PERT, CPM	09
March	Revision	02
April		

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Class:

B. SC-T.Y

Title of the Paper & No.: Linear Programming- (XIII -B₁) & Operations Research- (XV -B₁)

Name of the Teacher:

Dr. M.R. FEGADE

ANNUAL TEACHING PLAN 2019-20

Month	Course content	Expected Periods
June	Unit-I-Basics of operations Research: Introduction, scope, definition of operations research, Objectives of operations research, Phases of operations research, scope of operations research, Limitations of operations research.	05
July	Unit-II-Linear Programming Problem: Introduction, General Linear Programming problems, Mathematical Formulation of L.P.P., Basic solution, Non degenerate and Degenerate Basic solution, Important Themos Important Definitions, Convex set and Themos on it. Unit-III- Solution of L.P.P. by Graphical Method, Slack and surplus variables, some definitions and Notations. Fundamental Theorems of L.P.P (Only statement).	12
Aug	Basic Feasible Solution from feasible solution, Simplex Method of L.P.P, artificial variables, Big-M method, Numerical problems Unit-IV - Assignment problem: Introduction, Assignment problem, Mathematical Formulation of an Assignment problem, Unbalanced Assignment Problem, method for solving a minimal Assignment problem (Hungarian Method)	12
Sept	Unit-V-Transportation problem: Introduction, Difference between Transportation problem and Assignment problem, Important definitions, solution of Transportation problem, Initial feasible solution, North-West corner rule method, Lowest-cost entry method, Vogel's approximation method, Optimality test,	12
Oct.	computational procedure of Optimality test(Modified Distribution method), Resolving Degeneracy in Transportation problem, unbalanced Transportation problem	04
Nov		
Dec	Unit-I- Sequencing problem: Introduction, Sequencing problem, General Assumptions, Sequencing Decision problem for n-jobs on two Machines Traveling salesmen problem, solution of Traveling salesmen problem. Unit II:-Concept of Queue, Introduction to Queuing Theory, Queue Discipline, Inter time arrival distribution, service time distribution, waiting time	12
Jan	Unit-III-Game Theory, Introduction, Competitive game, Finite and Infinite Game, Zero-sum game, Two Person Game Zero-sum game, Payoff Matrix, Strategy, Solution of a game, value of a game, Saddle point, Solution of a rectangular game with Saddle point, Solution of 2 x 2 game without Saddle point, Dominance Property, Graphical Method for the, Solution of 2 x n and m x 2 games.	14

April		
March	Unit V- Critical path, Float of an activity and Event, Probability consideration in PERT, Distinguish between PERT and CPM.	07
Feb	Unit-IV-Network Analysis: Introduction, Network and basic components, Activity, Event, logical sequencing, Rules for network construction, Critical path analysis Forward pass calculation, Backward pass calculation.	12

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Department of Statistics

Annual Teaching Plan for 2020-2021

Work Distribution

Class		Dr. M.R. Fegade		Teachers	
B.Sc. I Sem.-I	Paper-I & II	Practical	Paper-V	---	---
B.Sc. I Sem.-II	Paper-III & IV	Practical	Paper-V	---	---
B.Sc. II Sem.-III	Paper-VII	Paper-XI	Paper-VI	Paper-IX	Paper-X
B.Sc. II Sem.-IV	Paper-IX	Paper-XI	Paper-VI	Paper-IX	Paper-X
B.Sc. III Sem.-V	Paper-XIII	Paper-XVII	Paper-XII	Paper-XII	Paper-XVI
B.Sc. III Sem.-VI	Paper-XV	Paper-XVII	Paper-XIV	Paper-XIV	Paper-XVI

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Class: B.S.C.-I, V
 Title of the Paper & No.: Practical - V Paper no.- XVII
 Name of the Teacher: Dr. M. R. Fegade

Month	Course content	Expected Periods
Aug	Formulation of Linear Programming Problem, Solution of L.P.P. by Graphical method.	12
Sept	Basic feasible solution of L.P.P., Solution of L.P.P. by Simplex method.	12
Oct	Solution of L.P.P. by Big-M method, Assignment problem, North-West Corner Rule method.	12
Nov	Matrix Minima method, Vogel's Approximation Method.	06
Dec	Optimality test, Unbalanced Transportation problem, Game with and without Saddle point.	12
Jan		
Feb	Graphical method to solve $2 \times n$ and $m \times 2$ Game, Dominance Property.	12
March	Sequencing, Queuing, Simulation.	09
April	Traveling salesman problem, PERT	
May	CPM	03

ANNUAL TEACHING PLAN 2020-21

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Class:

B. SC-T.Y

Title of the Paper & No.: Operations Research -I - (XIII -B) & Operations Research Techniques-II - (XV -B)

Name of the Teacher: DR. M.R. FEGADE

ANNUAL TEACHING PLAN 2020-21

Month	Course content	Expected Periods
Aug	Unit-I-Basics of operations Research: Introduction, scope, definition of operations research, Objectives of operations research, Phases of operations research, scope of operations research, Limitations of operations research.	09
Sept	Unit-II-Solution of L.P.P.: Introduction, General Linear Programming problems, Mathematical Formulation of L.P.P., Basic solution, Non degenerate and Degenerate Basic solution, Important Thermos Important Definitions, Convex set and Thermos on it. Solution of L.P.P. by Graphical Method, Slack and surplus variables, some definitions and Notations. Fundamental Theorems of L.P.P (Only statement).	12
Oct	Basic Feasible Solution from feasible solution, Simplex Method of L.P.P, artificial variables, Big-M method, Numerical problems. Unit-III-Transportation problem: Introduction, Difference between Transportation problem and Assignment problem, Important definitions, solution of Transportation problem, Initial feasible solution, North-West corner rule method, Lowest-cost entry method, Vogel's approximation method,	12
Nov	Optimality test, computational procedure of Optimality test (Modified Distribution method), Resolving Degeneracy in Transportation problem, unbalanced Transportation problem	05
Dec	Unit- IV- Assignment problem: Introduction, Assignment problem, Mathematical Formulation of an Assignment problem, Unbalanced Assignment Problem, method for solving a minimal Assignment problem (Hungarian Method)	12
Jan		
Feb	Unit-I- Sequencing problem: Introduction, Sequencing problem .General Assumptions, Sequencing Decision problem for n-jobs on two Machines Traveling salesmen problem, solution of Traveling salesmen problem. Unit II:-Concept of Queue, Introduction to Queuing Theory, Queue Discipline, Inter time arrival distribution, service time distribution.	12
March	waiting time queue length, busy and ideal period, M/M/1 Queue Model. Unit-III-Game Theory, Introduction, Competitive game, Finite and Infinite Game, Zero-sum game, Two Person Game Zero-sum game, Payoff Matrix, Strategy, Solution of a game, value of a game, Saddle point, Solution of a rectangular game with Saddle point, Solution of 2 x 2 game without Saddle point,	12

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May	Float of an activity and Event, Probability consideration in PERT, Distinguish between PERT and CPM.	05
April	Dominance Property, Graphical Method for the Solution of $2 \times n$ and $m \times 2$ games. Unit-IV-Network Analysis: Introduction, Network and basic components, Activity, Event, logical sequencing, Rules for network construction, Critical path analysis Forward pass calculation, Backward pass calculation, Critical path.	12



Class: BSC-FY
 Title of the Paper & No.: Practical - I Paper no.- V
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2019-20

Month	Course content	Expected Periods
Nov	Construction of Frequency distributions, Diagrammatic representation of data,	6
Dec	Graphical representation of data, Measures of central tendencies, Construction of partition values,	12
Jan	Computation of Moments, Skewness and kurtosis, Karl person's correlation coefficient, Spearman's rank correlation coefficient	12
Feb	Compute measures of dispersions and coefficient of variation, Fitting of linear Regression	12
Mar	Fitting of Binomial distribution, Fitting of Poisson distribution,	06
April	Fitting of Curves (!) $Y=ab^x$ (ii) Second degree curve. Attributes	12
May	Computation of probabilities of bivariate distribution, Most Plausible values of system of liner equations	09
June	*	

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Class:

B.SC-F.Y

Title of the Paper & No.: Descriptive Statistics and Computing – I & Theory of variables and Attributes- III
 Name of the Teacher: Dr. M.R. Fegade

Month	Course content	Expected Periods
June		

Nov	<p>Unit I: - Basic Statistics and Data Condensation: Meaning of statistics, Importance and scope of Statistic, Statistical Organizations in India and their functions, Types of data: Primary and secondary data. Scales of measurement of variables: Nominal, Ordinal, Ratio and Interval. Frequency distributions (continuous and discrete), Presentation of data,</p>	09
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Dec	<p>Graphical presentation of data by histogram, Frequency curve, Frequency polygon, Ogives, Stem and Leaf Chart, Diagrammatic presentation of data: Bar chart, multiple bar charts, pie chart. Unit –II:- Measures of Central Tendency: Measures of central tendency Arithmetic mean (simple and weighted and Trimmed mean), Combined mean, Geometric Mean, Harmonic Mean, Median, Mode, Derivation of Median formula for frequency distribution, Quartiles, Box Plot, Calculating quartiles by analytical and graphical method, Uses of Mean, Median, Mode, Harmonic Mean, Geometric Mean, Relation between means, Merits and demerits of measures of central tendency.</p>	12
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Jan	<p>Unit - III Measures of Dispersion: Concepts of measures of dispersion, Types of measures of dispersion, Range, Quartile Deviation, Mean absolute deviation about mean, median, mode, Standard deviation, Variance, Root mean square deviation, Properties of variance, relation between Root mean square deviation and Standard deviation, Coefficient of variation.</p>	12
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Feb.	<p>Unit IV: - Moments: Raw and central moments, moments about arbitrary point, Relation between raw moments and central Moments (Up to 4th order), Effect of change of origin and scale on moments, Sheppard's Correction for central moments, Pearson's coefficients, Measures of skewness, kurtosis. Unit V:-Statistical Computing Using Excel:- Graphical & Diagrammatic presentation of data, Computation of various measures of central tendency, dispersion, skewness and kurtosis, moments using ms-excel.</p>	12
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Mar	<p>Unit-I:- Bivariate data and Correlation: Graphical method to represents bivariate data, scatter diagram, concept of correlation, Karl persons' product moment correlation and its properties, independence and un co relatedness, Spearman rank correlation coefficient and its properties, derivation of rank correlation coefficient formula.</p>	12
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DEPARTMENT OF STATISTICS



Class: B.S.C.-S.Y
 Title of the Paper & No.: Practical - III Paper no.- XI
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2020-21

Month	Course content	Expected Periods
Aug	Fitting of Normal distribution, Problems based on area property of Normal distribution,	12
Sept	Chi-square test for population variance, Chi-square test for goodness of fit,	12
Oct	Chi-square test for 2x2 contingency table also using Yates correction, Chi-square test for Independence of attributes,	12
Nov	Chi-square test of Homogeneity of Correlation coefficients.	03
Dec	t-Test for single mean, t - Test for difference of means, Paired t - test	12
Jan	t - Test for testing the significance of sample correlation coefficient, F-Test for equality of two population variances	12
Feb	Wilcoxon signed rank test, Sign test for single sample & two sample	12
March	Run Test, Median Test, Mann - Whitney U Test	12
April	Applications of Fisher's Z-Transformation	03

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Class : B.Sc-S.Y

Title of the Paper & No.: Continuous Probability Distributions-VII & Exact Sampling Distributions-IX

Name of the Teacher: Dr.M.R.Fegade

ANNUAL TEACHING PLAN 2020-21

Month	Course content	Expected Periods
June	Revision:	

Aug	<p>Unit I - Uniform and Exponential Distribution:- i) Rectangular or Uniform distribution: Definition, Moments, Moment generating function, Mean, Variance, Mean deviation about mean, examples, problems and application, Relation with other distributions, Properties of Rectangular distribution. Distributions of distribution function of continuous random variable. ii) Exponential Distribution: - Probability density function, Moment Generating function, Mean and Variance, lack of memory property, problems, Relation between exponential distribution and uniform distribution.</p>	12
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Sept	<p>Unit-II- Normal Distribution:- Probability density function, Normal Distribution as a limiting form of Binomial Distribution Important characteristics of Normal Distribution and Normal Probability curve, Mode, Median, Quartiles, Moment Generating Function and Cumulant Generating Function, Moments, Additive property for Linear combination of two independent normal variables, Mean deviation about mean, Area property (Normal probability integral), Importance of normal distribution, fitting of normal distribution, Use of Normal probability plot</p>	12
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Oct	<p>Unit III:-Gamma Distributions- Gamma Distribution with single and two parameters, Moment Generating Function, Cumulant Generating Function, limiting form of Gamma Distribution, properties of Gamma Distribution, Beta Distribution of first and second kind, Moments of Beta Distributions, Relation between Exponential and Gamma Distribution as a sum of i.i.d. exponential random variables, Problems, examples, Applications, Transformation of one & Two Dimensional random variables.</p>	12
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Nov	<p>Unit IV: - Weibull and Cauchy Distribution: - Weibull Distribution:-Probability Density Function of Weibull Distribution with given shape and scale, parameter, Moments of standard Weibull Distribution, Characteristics of Weibull distribution</p>	06
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Dec	<p>Cauchy Distribution:- Probability density function of Cauchy Distribution, Characteristics of standard Cauchy Distribution, Comment on non existence, moments of standard Cauchy Distribution</p>	12
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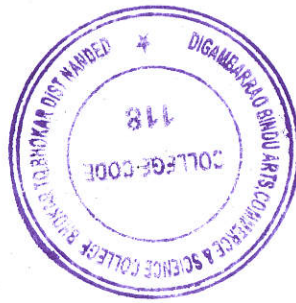
Department of Statistics

Annual Teaching Plan for 2021-2022

Work Distribution

Class		Dr. M.R. Fegade		Teachers	
B.Sc. I Sem.-I	Paper-I & II	Practical	Paper-V	---	---
B.Sc. I Sem.-II	Paper- III & IV	Practical	Paper-V	---	---
B.Sc. II Sem.-III	Paper-VII	Paper-XI	Paper-VI	Paper-IX	Paper-X
B.Sc. II Sem.-IV	Paper-IX	Paper-XI	Paper-VI	Paper-IX	Paper-X
B.Sc. III Sem.-V	Paper-XIII	Paper-XVII	Paper-XII	Paper-XII	Paper-XVI
B.Sc. III Sem.-VI	Paper-XV	Paper-XVII	Paper-XIV	Paper-XIV	Paper-XVI

Head
Dr. Madhav R. Fegade
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Month	Course content
Expected Periods	

Oct	<p>Unit I - Basic Statistics and Data Condensation: Meaning of statistics, Importance and scope of Statistics, Statistical Organizations in India and their functions, Types of data: Primary and secondary data. Scales of measurement of variables: Nominal, Ordinal, Ratio and Interval. Frequency distributions (continuous and discrete), Presentation of data, Graphical presentation of data by histogram, Frequency curve, Frequency polygon, Ogives, Stem and Leaf Chart. Diagrammatic presentation of data: Bar chart, multiple bar charts, pie chart.</p> <p>Unit - II:- Measures of Central Tendency: Measures of central tendency Arithmetic mean (simple and weighted and Trimmed mean), Combined mean, Geometric Mean, Harmonic Mean, Median, Mode, Derivation of Median formula for frequency distribution, Quartiles, Box Plot, Calculating quartiles by analytical and graphical method, Uses of Mean, Median, Mode, Harmonic Mean, Geometric Mean, Relation between means, Merits and demerits of measures of central tendency.</p>	10
Nov	<p>Unit - III Measures of Dispersion: Measures of dispersion, Types of measures of dispersion, Range, Quartile Deviation, Mean absolute deviation about mean, mode, Standard deviation, Variance, Root mean square deviation, Properties of variance, relation between Root mean square deviation and Standard deviation, Coefficient of variation.</p> <p>Unit IV:- Moments: Raw and central moments, moments about arbitrary point, Relation between raw moments and central Moments (Up to 4th order), Effect of change of origin and scale on moments, Sheppard's Correction for central moments, Pearson's coefficients, Measures of skewness, Kurtosis.</p> <p>Unit V:- Statistical Computing Using Excel:- Graphical & Diagrammatic presentation of data, Computation of various measures of central tendency, dispersion, skewness and kurtosis, moments using ms-excel.</p>	14
Dec	<p>Unit I:- Bivariate data and Correlation: Graphical method to represents bivariate data, scatter diagram, concept of correlation.</p>	05
Jan	<p>Karl persons' product moment correlation and its properties, independence and unco relatedness, Spearman rank correlation coefficient and its properties, derivation of rank correlation coefficient formula.</p> <p>Unit - II: Linear Regression:- Regression coefficients, coefficient of determination, lines of regression and their properties, properties of regression coefficients, derivation of lines of regression, residuals and their properties, residuals plot.</p>	14
Feb		
Mar		

	<p>Unit -III:-Fitting of curves:- Legendre's principle of least squares, fitting of straight line, Second degree curve and Exponential curve, Power curve, Logistic curve $y = k/1+Exp(a+ b x)$, interpretation of Regression coefficients, most plausible solution of system of liner equations.</p>	
	<p>Unit: IV:- Theory of Attributes:- Concepts of attributes, Notation, Classification using dichotomy, class frequency, order or classes, positive and negative class frequencies, ultimate class frequencies, relation between class frequencies, consistency of attributes, (up to three attributes) independent and association of two attributes, Yule's coefficient of association Q.</p>	14
April	<p>Unit: V: Computation using Excel: Coefficient of colligation Y. Relation between them.</p>	
May	<p>Computation of Karl person's correlation coefficient, Spearman rank correlation coefficient, fitting of regression line, curves. Decide the best fit using R^2 with the help of ms-excel.</p>	12
June		

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Class: B. SC. Second Year
 Title of the Paper & No.: Practical - III Paper no.- XI
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2021-22

Month	Course content	Expected Periods
Sept	Fitting of Normal distribution, Problems based on area property of Normal distribution,	09
Oct	Chi-square test for population variance, Chi-square test for goodness of fit,	12
Nov	Chi-square test for 2x2 contingency table also using Yates correction, Chi-square test for Independence of attributes,	06
Dec	Chi-square test of Homogeneity of Correlation coefficients.	12
Jan	t-Test for single mean, t - Test for difference of means, Paired t - test	12
Feb		
March	t - Test for testing the significance of sample correlation coefficient, F-Test for equality of two population variances	12
April	Wilcoxon signed rank test, Sign test for single sample & two sample	12
May	Run Test, Median Test, Mann - Whitney U Test, Applications of Fisher's Z-Transformation	12

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Class: B. SC. Third Year
 Title of the Paper & No.: Practical - V
 Name of the Teacher: Dr. M. R. Fegade
 Paper No.- XVII

Month	Course content	Expected Periods
Sept	Formulation of Linear Programming Problem, Solution of L.P.P. by Graphical method.	09
Oct	Basic feasible solution of L.P.P., Solution of L.P.P. by Simplex method.	12
Nov	Solution of L.P.P. by Big-M method, Assignment problem, North-West Corner Rule method.	06
Dec	Matrix Minima method, Vogel's Approximation Method.	06
Jan	Optimality test, Unbalanced Transportation problem, Game with and without Saddle point.	12
Feb	Graphical method to solve $2 \times n$ and $m \times 2$ Game, Dominance Property,	12
March	Sequencing, Queuing, Simulation, Traveling salesman problem	12
April	PERT, CPM	12
May		06

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Class: B. SC. Third Year
 Title of the Paper & No.: Operations Research -I - (XIII -B) & Operations Research Techniques-II - (XV -B)
 Name of the Teacher: Dr. M.R. FEGADE

Month	Course content	Expected Periods
Sept	Unit-I-Basics of operations research, Phases of operations research, scope of operations research, Objectives of operations research, Limitations of operations research.	07
Oct	Unit-II-Solution of L.P.P.: Introduction, General Linear Programming problems, Mathematical Formulation of L.P.P., Basic solution, Non degenerate and Degenerate on it, Solution of L.P.P. by Graphical Method, Slack and surplus variables, some definitions and Notations. Fundamental Theorems of L.P.P (Only statement).	12
Nov	Basic Feasible Solution from feasible solution, Simplex Method of L.P.P, artificial variables, Big-M method, Numerical problems.	05
Dec	Unit-III-Transportation problem: Introduction, Difference between Transportation problem and Assignment problem, Important definitions, solution of Transportation problem, Initial feasible solution, North-West corner rule method, Lowest-cost entry method, Vogel's approximation method, Optimality test, computational procedure of Optimality test (Modified Distribution method), Resolving Degeneracy in Transportation problem, unbalanced Transportation problem.	12
Jan	Unit-IV - Assignment problem: Introduction, Assignment problem, Mathematical Formulation of an Assignment problem, Unbalanced Assignment Problem, method for solving a minimal Assignment problem (Hungarian Method)	12
Feb	Unit-I- Sequencing problem: Introduction, Sequencing problem, General Assumptions, Sequencing Decision problem for n-jobs on two Machines	05
March	Unit II:-Concept of Queue, Introduction to Queuing Theory, Queue Discipline, Traveling salesmen problem, solution of Traveling salesmen problem.	14
April	Unit-III-Game Theory, Introduction, Competitive game, Finite and Infinite Game, Zero-sum game, Two Person Game Zero-sum game, Payoff Matrix, Strategy, Solution of a game, value of a game, Saddle point, Solution of a rectangular game with Saddle point, Solution of 2×2 game without Saddle point, Dominance Property, Graphical Method for the Solution of $2 \times n$ and $m \times 2$ games.	14
May	Unit-IV-Network Analysis: Introduction, Network and basic components, Activity, Event, logical sequencing, Rules for network construction, Critical path analysis Forward pass calculation, Backward pass calculation, Critical path. Float of an activity and Event, Probability consideration in PERT, Distinguish between PERT and CPM.	12

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Class : B.Sc. Second Year
 Title of the Paper & No.: Continuous Probability Distributions-VII & Exact Sampling Distributions-IX
 Name of the Teacher: Dr. M. R. Fegade

Month	Course content
Aug	Revision:
Sept	Unit I - Uniform and Exponential Distribution:- i) Rectangular or Uniform distribution: Definition, Moments, Moment generating function, Mean, Variance, Mean deviation about mean, examples, problems and application, Relation with other distributions, Properties of Rectangular distribution. Distributions of distribution function of continuous random variable. ii) Exponential Distribution: - Probability density function, Moment Generating function, Mean and Variance, lack of memory property, problems, Relation between exponential distribution and uniform distribution. Unit-II- Normal Distribution:- Probability density function, Normal Distribution as a limiting form of Binomial distribution, Important characteristics of Normal Distribution and Normal Probability curve, Mode, Median, Quartiles, Moment Generating Function and Cumulant Generating Function, Moments, Additive property for Linear combination of two independent normal variables, Mean deviation about mean, Area property (Normal probability integral), Importance of normal distribution, fitting of normal distribution, Use of Normal Probability plot Unit III:- Gamma Distributions- Gamma Distribution with single and two parameters, Moment Generating Function, Cumulant Generating Function, limiting form of Gamma Distribution, properties of Beta Distribution of first and second kind, Moments of Beta Distributions, Relation between Exponential and Gamma Distribution as a sum of i.i.d. exponential random variables, Problems, examples, Applications, Transformation of one & Two Dimensional random variables. Unit IV: - Weibull and Cauchy Distribution: - Weibull Distribution:- Probability Density Function of Weibull Distribution with given shape and scale, parameter, Moments of standard Weibull Distribution, Characteristics of Weibull distribution Cauchy Distribution:- Probability density function of Cauchy Distribution, Characteristics of standard Cauchy Distribution Unit V: Logistic Distribution: - Central Limit theorem, Application of central limit theorem, Probability density function of Logistic distribution, moment generating function of Logistic distribution, problems, De-Moivre, Laplace Theorem. Unit I:- Chi-square Distribution: - Chi-Square variate, Derivation of Chi-Square Distribution (Using method of moment generating function), Nature of Chi-Square probability curve, moment generating function, Cumulant Generating Function, limiting form of Chi-Square Distribution for large Degrees of Freedom Moments, Mode and Skewness of Chi-Square Distribution, Additive property.
Oct	12
Nov	05
Dec	12
Jan	12
Feb	05
March	14

June	distribution, Fisher's Z Transformation, problems
May	Probability density function of Fisher's Z Distribution, Moment generating function of Z-
April	<p>Unit II:- Applications of Chi-square distribution:-</p> <p>(iii) Test of independence of attributes, contingency table, Yates correction for 2x2 contingency table (iv) Homogeneity of three or more correlation Coefficients, Problems</p> <p>Unit III:- t - Distribution:-</p> <p>Students' t statistic, Derivation of student's t distribution, Fisher's t, Distribution of Fisher's t, moments of t- distribution, limiting form of t-distribution, graph of t- distribution.</p> <p>Unit-V:- Fisher's Z - Distribution:-</p>
14	
12	

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Class: B. Sc. First Year
 Title of the Paper & No.: Practical - I Paper no.- V
 Name of the Teacher: Dr. M. R. Fegade

ANNUAL TEACHING PLAN 2021-22

Month	Course Content	Expected Periods
Oct	Construction of Frequency distributions, Diagrammatic representation of data,	06
Nov	Graphical representation of data, Measures of central tendencies, Construction of partition values,	06
Dec.	Computation of Moments, Skewness and kurtosis, Karl person's correlation coefficient, Spearman's rank correlation coefficient	12
Jan	Compute measures of dispersions and coefficient of variation, Fitting of linear Regression	12
Feb		
Mar	Fitting of Binomial distribution, Fitting of Poisson distribution,	12
April	Fitting of Curves (i) $Y=ab^x$ (ii) Second degree curve, Attributes Computation of probabilities of bivariate	12
May	distribution, Most Plausible values of system of linear equations	09
June		

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