VIJAYA COLLEGE, R V ROAD, BANGALORE – 560 004

DEAPARTMENT OF STATISTICS

ACADEMIC PLANNER & UNITIZATION OF SYLLABUS, 2024
(EVEN SEMESTER)

2nd SEMESTER B.Sc, PAPER – 2, Probability and Distributions)
(56 Hours, 4 Hours of Theory per week)

Month & Year	Session Number	Portions planned for one Hour	Remarks
MARCH-2024	1	Theoretical discrete vs Continuous distributions	**NVP**
	2	Bernoulli distribution – Definition through pmf, E(X) and V(X)	**NVP**
	3	**Unit –1 : Probability**	**RP**
	4	Random experiment, sample space and events, algebra of events.	**RP**
APRIL-2024	5	Binomial distribution – Definition through pmf, E(X) and V(X)	**NVP**
	6	Binomial distribution – MGF, Recurrence relation, Moments	**NVP**
	7	Definitions of Probability- Classical, statistical, subjective and axiomatic approaches – illustrations and applications,	**RP**
	8	Definitions of Probability- Classical, statistical, subjective and axiomatic approaches – illustrations and applications,	**RP**
	9	Additive property of Binomial distribution	**NVP**
	10	β_1 and β_2 of Binomial distribution	**NVP**
	11	Definitions of Probability- Classical, statistical, subjective and axiomatic approaches – illustrations and applications,	**RP**
	12	Addition rule	**RP**
	13	Poisson distribution – Definition through pmf, E(X) and V(X)	**NVP**
	14	Poisson distribution – MGF, derivation of moments from MGF	**NVP**
	15	Conditional probability, independence of events and multiplication rule,	**RP**
	16	Conditional probability, independence of events and multiplication rule,	**RP**
	17	Recurrence relations for moments of Poisson distribution	**NVP**
	18	Additive property of Poisson distribution	**NVP**
	19	Conditional probability, independence of events and	**RP**

		multiplication rule,	
	20	Total probability rule	**RP**
MAY-2024	21	β_1 and β_2 of Poisson distribution	**NVP**
	22	Geometric Distribution, pmf, Mean, Variacne, MGF, Dist Function	**NVP**
	23	Bayes theorem- applications	**RP**
	24	**Unit –2: Random Variables And Mathematical Expectation - (One Dimension)**	**RP**
	25	Uniform Distribution, pmf, Mean, Variacne, MGF, Dist Function	NVP
	26	Gamma distribution of 1st kind – Mean, Variance, r th moment	NVP
	27	Definitions of discrete and continuous random variables,	**RP**
	28	Distribution function,	**RP**
	29	Gamma distribution of 2nd kind – Mean, Variance, r th moment	**NVP**
	30	Limiting property of Gamma distribution	**NVP**
	31	probability mass and density functions – properties and illustrations,	**RP**
	32	DO	**RP**
JUNE-2024	33	Beta distribution of 1st kind – Mean, Variance, HM	**NVP**
	34	Beta distribution of 2nd kind – Mean, Variance, HM	**NVP**
	35	Expectation of a random variable and rules of expectation and related results,	**RP**
	36	Expectation of a random variable and rules of expectation and related results,	**RP**
	37	Exponential distribution with parameter θ, Mean, Variance, MGF, r th moment	**NVP**
	38	Exponential distribution with parameter $\frac{1}{\theta}$, Mean, Variance, MGF, r th moment	**NVP**
	40	Expectation of a random variable and rules of expectation and related results,	**RP**
	41	Probability generating function,	**RP**
	42	Normal distribution, definition, Mean, Variance, MGF	**NVP**
	43	Normal distribution, derivation of Median, Mode, MD from Mean, Symmetric about Mean	**NVP**
	44	Moments and moment generating function	**RP**
	45	Moments and moment generating function – properties and uses.	**RP**

	46	Linear combination of n independent Normal random variables	**NVP**
	47	Standard Normal variate, Mean, Variance and MGF	**NVP**
	48	Moments and moment generating function – properties and uses.	**RP**
	49	Moments and moment generating function – properties and uses.	**RP**
JULY - 2024	50	Introduction to R software, Installation and other related issues	**NVP**
	51	R as calculator, Basic Mathematical operations	**NVP**
	52	Revision	**RP**
	53	Discussion of previous year's question papers	**RP**
	54	Evaluation of simple expressions, Hierarchy of operators	**NVP**
	55	Standard Mathematical and Statistical functions with syntax	**NVP**
	56	Revision	**RP**
	57	Discussion of previous year's question papers	**RP**
	58	Creation of vectors using different operators (c, seq, : , ……)	**NVP**
	59	Calculation various statistical measures Central tendency and Dispersion	**NVP**
	60	Revision	**RP**
	61	Discussion of previous year's question papers	**RP**
	62	Introduction to plotting function in R, Different parameters, syntax involved in plotting function in R	**NVP**
	63	Bar plot, Pie chart, Histogram, Box plot, Histogram etc	**NVP**

PRAVEEN N V
Assistant Professor

R PRAKASH
HOD

PRINCIPAL

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DEAPARTMENT OF STATISTICS

ACADEMIC PLANNER & UNITIZATION OF SYLLABUS, 2024
(EVEN SEMESTER)

4th SEMESTER B.Sc, PAPER – 4 (Statistical Inference - I)
(56 Hours, 2 Hours of Theory per week)

Month & Year	Session Number	Portions planned for one Hour	Remarks
MARCH-2024	1	Family of distributions, Introduction, definitions	
	2	Location and Scale families of distributions	
	3	**UNIT- 3: Testing of Hypotheses- Introduction**	
	4	Statistical hypotheses - null and alternative,	
APRIL-2024	5	Single parameter exponential family (Definition, Introduction)	
	6	Single parameter exponential family (Problems)	
	7	Simple and composite hypotheses. Type-I and Type-II errors	
	8	Unbiased estimation (Definition and Introduction)	
	9	Unbiased estimation, examples and problems	
	10	Finding unbiased estimators for given PMF/PDF	
	11	test functions. Randomized and non-randomized tests.	
	12	Size, level of significance, Power function, power of tests.	
	13	Consistency (definition and examples)	
	14	Invariance property of consistent estimators, problems	
	15	Critical region, p- value and its interpretation	
	16	Most Powerful (MP) and UMP test.	
	17	Efficiency and relative efficiency. Mean squared error	
	18	Mean squared error for comparison of estimators	
	19	Statement of Neyman-Pearson Lemma and its applications.	
	20	Statement of Neyman-Pearson Lemma and its applications.	
MAY-2024	21	Sufficient statistics, Definition and Introduction	
	22	Neyman Factorization criterion, Problems	
	23	Statement of Neyman-Pearson Lemma and its applications.	
	24	Statement of Neyman-Pearson Lemma and its applications.	
	25	Fisher's Information function, its significance	

	26	Crammer – Rao Inequality and its applications	
	27	Statement of Neyman-Pearson Lemma and its applications.	
	28	Minimum Variance Unbiased Estimator (MVUE)	
	29	Problems based on MVUE	
	30	**Large and small samples tests of significance**. Tests for single mean,	
	31	Tests for single mean, equality of two means,	
	32	Minimum Variance Bound Estimator (MVBE)	
	33	Problems based on MVBE	
	34	Tests for equality of two means,	
	35	Test of equality of two variances for normal populations.	
	36	Maximum Likelihood Estimation (MLE)	
JUNE-2024	37	Properties of MLE and Computation of MLE	
	38	Tests for proportions.	
	39	Tests for proportions.	
	40	Moment estimators	
	41	Construction of Moment estimators	
	42	**UNIT- 4: Interval Estimation**	
	43	Confidence interval, confidence coefficient, shortest confidence interval.	
	44	Computation of MLE	
	45	Moment estimation, concept, uses examples	
	46	Methods of constructing confidence intervals using pivotal quantities.	
	47	Methods of constructing confidence intervals using pivotal quantities.	
	48	Moment estimators - problems	
	49	Moment estimators - problems	
	50	Construction of confidence intervals for mean,	
	51	Construction of confidence intervals for difference of two means,	
	52	Revision of previous year question papers	
JULY-2024	53	Revision of previous year question papers	

	54	Construction of confidence intervals for variance	
	55	Construction of confidence intervals ratio of variances,	
	56	Revision of previous year question papers	
	57	Revision of previous year question papers	
	58	Construction of confidence intervals for proportions, difference of two proportions	
	59	Construction of confidence intervals for correlation coefficient.	
	60	Mock test	

PRAVEEN N V
Assistant Professor

R PRAKASH
HOD

PRINCIPAL

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DEAPARTMENT OF STATISTICS

ACADEMIC PLANNER & UNITIZATION OF SYLLABUS, 2024
(EVEN SEMESTER)

6th SEMESTER, PAPER – 7 (STAC11-T – Analysis of variance and Design of experiments (Theory))

(60 Hours, 4 Credits, Theory : 4 Hours/week, Lab : 4 Hours/Week/Batch, FAM*: 40, SAM**: 60, Duration of SEA exams : 2 Hours 30 Minutes)

Month & Year	Session Number	Portions planned for one Hour	Remarks
APRIL-2024	1	Unit 1-ANOVA : meaning & assumptions.	**RP**
	2	models	**RP**
	3	One way ANOVA- basics, model etc.	**RP**
	4	Analysis- estn. Of parameters	**RP**
	5	Sum of Squares, MSS, F cal etc..	**RP**
	6	Expectation of trss and ESS	**RP**
	7	Two-way ANOVA—basics, assumptions	**RP**
	8	Expectation of trss, BSS	**RP**
	9	Expectation of ESS,.	**RP**
	10	Two-way ANOVA Multiple obs/cell—basics, assumptions	**RP**
	11	Expectation of trss, BSS	**RP**
	12	Expectation of ESS,.	**RP**
	13	Tukey method etc	**RP**
	14	UNIT 2: EXPERIMENTAL DESIGNS	**RP**
	15	Principles of design of experiments.	**RP**
	16	Principles of design of experiments	**RP**
MAY- 2024	17	Principles of design of experiments	**RP**
	18	CRD- basics , model and analysis	**RP**
	19	CRD analysis continue	**RP**
	20	RBD design: basics, model, analysis	**RP**
	21	RBD analysis continuation	**RP**
	22	LSD design: basics, model etc..	**RP**
	23	LSD analysis continuation	**RP**

	24	LSD analysis continuation	**RP**
	25	LSD analysis completion- anova table, inference etc..	**RP**
	26	Estimation of a missing observation in RBD and its analysis.	**RP**
	27	Estimation of a missing observation in LSD and its analysis.	**RP**
	28	DO	**RP**
	29	Introduction to incomplete block designs, BIBD and its analysis, Yuden square designs,	**RP**
	30	Introduction to incomplete block designs, BIBD and its analysis, Yuden square designs,	**RP**
	31	Introduction to incomplete block designs, BIBD and its analysis, Yuden square designs,	**RP**
	32	Introduction to incomplete block designs, BIBD and its analysis, Yuden square designs,	**RP**
JUNE 2024	33	Factorial experiments—basic concepts	**RP**
	34	Basic concepts – main and interaction effects,	**RP**
	35	Basic concepts – main and interaction effects, and orthogonal contrasts in 2^2 factorial experiments.	**RP**
	36	Yates' method of computing factorial effects total.	**RP**
	37	Basic concepts – main and interaction effects, and orthogonal contrasts in 2^3 factorial experiments.	**RP**
	38	Yates' method of computing factorial effects total.	**RP**
	39	do	**RP**
	40	Basic concepts – main and interaction effects, and orthogonal contrasts in 2^2 and 2^3 factorial experiments.	**RP**
	41	Yates' method of computing factorial effects total.	**RP**
	42	do	**RP**
	43	Analysis of $2^2$and 2^3factorial experiments in RBD, Need for confounding.	**RP**
	44	Types of confounding - Complete and partial,	**RP**
	45	Confounding in a 2^3 - factorial experiment in RBD and its analysis.	**RP**
	46	Types of confounding - Complete Confounding in a 2^3 - factorial experiment in RBD and its analysis	**RP**
	47	do	**RP**
	48	Partial Confounding in a 2^3 - factorial experiment in RBD and its analysis	**RP**
	49	do	**RP**
JULY-2024	50	Revision of question papers	**RP**
	51	Revision of question papers	**RP**

	52	Revision of question papers	**RP**
	53	Revision of question papers	**RP**
	54	Revision of question papers	**RP**
	55	Revision of question papers	**RP**

*** FAM : Formative Assessment Marks**
**** SAM : Summative Assessment Marks**

R PRAKASH

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DEAPARTMENT OF STATISTICS

ACADEMIC PLANNER & UNITIZATION OF SYLLABUS, 2024 (EVEN SEMESTER)

6th SEMESTER, PAPER – 8 (STAC16T – Applied Statistics) (60 Hours, 4 Credits, Theory : 4 Hours/week, Lab : 4 Hours/Week/Batch, FAM*: 40, SAM**: 60, Duration of SEA exams : 2 Hours 30 Minutes)

Month & Year	Session Number	Portions planned for one Hour	Remarks
APRIL-2024	1	Introduction to OR, Various Definitions	**NVP**
	2	Linear Programming Problem, Introduction	**NVP**
	3	Formulation of LPP	**NVP**
	4	**Unit 4: Demography (Vital Statistics)**	**RP**
	5	Graphical method of solving LPP	**NVP**
	6	Special cases	**NVP**
	7	Special cases continued	**NVP**
	8	Sources of demographic data.	**RP**
	9	Canonical and Standard forms of LPP	**NVP**
	10	Basic, Basic Feasible, Non degenerate solution.	**NVP**

	11	Simplex Method – Applicability	**NVP**
	12	Measurement of Mortality: crude, specific death rates.	**RP**
	13	Simplex Algorithm	**NVP**
	14	Simplex Algorithm (Unique/Multiple/Unbounded/Infeasible)	**NVP**
	15	Big M Method	**NVP**
	16	Measurement of Mortality: standardized death rates. Infant mortality rate, maternal mortality rate.	**RP**
MAY-2024	17	Big M Method continued	**NVP**
	18	Duality in LPP	**NVP**
	19	Writing the Dual when Primal is given (special cases)	**NVP**
	20	Measurement of fertility: crude, age specific, general, and total fertility rates.	**RP**
	21	Transportation problem (TP), Definition, as an LPP	**NVP**
	22	IBFS (NWCR,VAM)	**NVP**
	23	Assignment Problem (AP) Definition, as an LPP	**NVP**
	24	Measurement of fertility: crude, age specific, general, and total fertility rates.	**RP**
	25	Complete Enumeration vs Hungarian Method	**NVP**
	26	Game theory, Introduction, Definitions	**NVP**
	27	Minimax – Maximin Principle - problems	**NVP**
	28	Reproduction rates,	**RP**
	29	Dominance Rule - problems	**NVP**
	30	Mixed Strategy problem, 2 × 2 problem (Without saddle point)	**NVP**
	31	Graphical method 2 × n problem	**NVP**
	32	Reproduction rates contd.	**RP**
JUNE-2024	33	Graphical method m × 2 problem	**NVP**
	34	Index number, Introduction and types	**NVP**
	35	Steps involved in the construction of Index numbers	**NVP**
	36	Life table: Components of a life table,	**RP**
	37	Price and quantity index numbers (various types)	**NVP**
	38	Construction of price and quantity index numbers by various methods	**NVP**
	39	Time Reversal Test (TRT)	**NVP**
	40	Life table: force of morality and expectation of life	**RP**

	41	Factor Reversal Test (FRT)	**NVP**
	42	Consumer Price Index numbers	**NVP**
	43	Steps involved in the construction of Price Index numbers	**NVP**
	44	Construction of a life table. Uses of a life table.	**RP**
	45	Family Budget method and Aggregative expenditure method	**NVP**
	46	Uses and Limitations of CPIN	**NVP**
	47	Introduction to Time series	**NVP**
	48	Construction of a life table.	**RP**
JULY-2024	49	Components of Time series	**NVP**
	50	Method of Moving averages	**NVP**
	51	Method of Least squares (Linear trend equation)	**NVP**
	52	Uses of a life table.	**RP**
	53	Method of Least squares (Second degree trend equation)	**NVP**
	54	Method of Least squares (Exponential trend equation)	**NVP**
	55	Seasonal Indices : Definition and uses	**NVP**
	56	Revision	**RP**
	57	Different methods of constructing Seasonal Indices, Interpretation	**NVP**
	58	Seasonal Indices by Method of Simple averages	**NVP**
	59	Seasonal Indices by Ratio to moving averages	**NVP**
	60	Revision	**RP**
	61	Discussion of previous year's question papers	**NVP**
	62	Discussion of previous year's question papers	**NVP**

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**** SAM : Summative Assessment Marks**

PRAVEEN N V **R PRAKASH**

Assistant Professor,
Department of Statistics,
Vijaya College, R V Road,
Bangalore – 560 004

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DEAPARTMENT OF STATISTICS

ACADEMIC PLANNER & UNITIZATION OF SYLLABUS, 2024
(EVEN SEMESTER)
2nd SEMESTER B.Com, DA 2.2 – Business Statistics - 2
(56 Hours, 4 Hours of Theory per week)

Month & Year	Session Number	Portions planned for one Hour	Faculty
	1	Linear Regression Analysis (Introduction)	**NVP**
	2	Regression Equations (y on x and x on y)	**NVP**
	3	Regression Lines (Graph of Regression equations)	**NVP**
	4	Testing of Hypothesis, Basics, Need, Definitions	**RP**
	5	Problems on Regression lines and estimation	**NVP**
	6	Problems on Regression lines and estimation	**NVP**
	7	Problems on Regression lines and estimation	**NVP**
	8	Test for single mean (known population variance)	**RP**
	9	Time Series Analysis – Introduction	**NVP**
	10	Components of Time series, definition with examples	**NVP**
	11	Uses and Applications of time series	**NVP**
	12	Test for single mean (unknown population variance)	**RP**
	13	Trend by Free hand Method	**NVP**
	14	Method of Semi averages	**NVP**
	15	Method of Moving averages (n is odd)	**NVP**
	16	Test for difference or equality of two means (Large samples)	**RP**
	17	Method of Moving averages (n is even)	**NVP**
	18	Method of Least squares (Straight Line) – n is odd	**NVP**
	19	Method of Least squares (Straight Line) – n is even	**NVP**
	20	Test for difference or equality of two means (Small samples)	**RP**
	21	Method of Least squares (Parabolic trend) – n is odd	**NVP**
	22	Method of Least squares (Parabolic trend) – n is even	**NVP**
	23	Method of Least squares (Exponential trend) – n is odd	**NVP**
	24	Paired t test (Dependent samples)	**RP**
	25	Method of Least squares (Exponential trend) – n is even	**NVP**
	26	Normal distribution (Definition, Properties)	**NVP**
	27	Normal distribution (Problems)	**NVP**

	28	Paired t test (Dependent samples)	**RP**
	29	Normal distribution (Problems)	**NVP**
	30	Normal distribution (Problems)	**NVP**
	31	ANOVA, need, significance, assumption	**NVP**
	32	Test for Proportions (Single proportion)	**RP**
	33	ANOVA – One way classification problems	**NVP**
	34	ANOVA – One way classification problems	**NVP**
	35	Fisher's Least Significance Test	**NVP**
	36	Test for equality of two proportions	**RP**
	37	ANOVA – Two way classification problems	**NVP**
	38	ANOVA – Two way classification problems	**NVP**
	39	Discussion of previous year question papers	**NVP**
	40	Test for equality of two population variances	**RP**
	41	Discussion of previous year question papers	**NVP**
	42	Discussion of previous year question papers	**NVP**
	43	Confidence Intervals (based on large sample)	**RP**
	44	Confidence Intervals (based on small sample)	**RP**
	45	Revision of previous year question papers	**NVP**
	46	Revision of previous year question papers	**NVP**
	47	Revision of previous year question papers	**RP**
	48	Revision of previous year question papers	**RP**
	49		
	50		
	51		
	52		

PRAVEEN N V
Assistant Professor

R PRAKASH
HOD

PRINCIPAL