

**Program Name: Bachelor of Computer Applications** 

Level: Under Graduate

Course / Subject Code : BC02001041

**Course / Subject Name : Advanced Statistical Methods** 

w. e. f. Academic Year:	2024-25
Semester:	2
Category of the Course:	Minor Elective Subject

Prerequisite:	Logical Thinking and Basic Statistical Concepts
Rationale:	The course aims to impart sampling and distribution of data, testing over various populations and perform various operations that leads to decision making.

#### **Course Outcome:**

After completion of the course, student will able to:

No.	Course Outcomes	<b>RBT Level*</b>
CO1	Apply sampling and statistical inference methods to estimate population	AP
	parameters, including the mean, proportion, variance, and sample size, using appropriate statistical techniques.	
CO2	Evaluate various statistical hypothesis tests, including those for population means, proportions, and variances, using z and t statistics, and apply appropriate methods to compare two populations through confidence intervals and hypothesis testing, interpreting the results in the context of real-world data.	AN
CO3	Analyze the results of one-way ANOVA and Chi-square tests (goodness of fit and test of independence) to determine patterns, relationships, and significant differences in data sets, and evaluate the appropriate application of each statistical method in real-world scenarios.	AN
CO4	Analyze the application of Tukey's Honestly Significant Difference (HSD) test for multiple comparisons with equal sample sizes and evaluate the regression line equation in simple regression analysis to predict relationships between variables.	AN

# **Teaching and Examination Scheme:**

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	A	Total			
т	т	DD	С	Т	'heory	Tutorial / I	Marks	
L	1	IK	C	ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	2	4	70	30	20	30	150



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# **Course Content:**

Unit	Content	No. of	Weightage
NO.	Sampling and Sampling Distributions:	11	(%) 25%
1		11	2570
	Concept of Sampling		
	Sampling Distribution of sample mean		
	Sampling Distribution of sample proportion		
	Statistical Inference: Estimation for Single Population:		
	Estimating the population mean using z and t statistic		
	Estimating the population proportion		
	Estimating the population variance		
	Estimating sample size		
2	Statistical Inference: Hypothesis Testing for Single Population:	12	25%
	Introduction to Hypothesis Testing		
	Hypothesis Testing about a population mean using z and t statistic		
	Hypothesis Testing about a proportion		
	Hypothesis Testing about a variance		
3	Statistical Inferences about Two Populations:	12	25%
	Hypotheses Testing and confidence intervals about the difference in		
	two means using z and t statistic		
	Statistical Inferences for Two related populations		
	Statistical Inferences about two population proportions		
	Hypothesis Testing about two population variances		
4	Analysis of Variance:	6	15%
	One-way ANOVA		
	Analysis of Categorical Data:		
	Chi-square goodness of fit test		
	Chi-square test of independence		
5	Multiple Comparison Tests:	4	10%
	Tukey's Honestly Significant Difference (HSD) Test: The Case of		
	Equal Sample Sizes.		
	Overview:		



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Simple Regression Analysis, Introduction, Determine the Equation of Regression Line		
Total Hours:	45	100

#### **Suggested Specification Table with Marks (Theory):**

Distribution of Theory Marks									
R Level	U Level	A Level	N Level	E Level	C Level				
-	10	30	60	-	-				

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

# **References/Suggested Learning Resources:**

#### (a) Textbook:

Sr No	Author	Name of the Book	Publisher	Year of Edition
1	Ken Black	Business Statistics for	Wiley	10 <sup>th</sup>
		Contemporary Decision making		

#### **Reference Books:**

No.	Author	Name of the Book	Publisher	Year of Edition
1	Sanjiv Jaggia, Alison Kelly	Business Statistics	McGraw Hill	Latest
2	Richard I. Levin and David S.Rubin	Statistics for Management	Pearson	Latest
3	D. P. Apte	Statistics for Managers	Excel	Latest
4	Gerald Keller & Hitesh Arora	Business Statistics	Cengage	Latest
5	D. P. Apte	M. S. Excel: Statistical Tools for Managers	Excel	Latest
6	Naval Bajpai	Business Statistics	Pearson	Latest

No	Title
1	Testing of significance and confidence intervals for single proportion and difference of
	two proportions.



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2	Testing of significance and confidence intervals for single mean and difference of two
	means and paired tests.
3	Testing of significance and confidence intervals for difference of two standard deviations.
4	Sample Tests based on Chi-Square Distribution.
5	Testing if the population variance has a specific value and its confidence intervals.
6	Testing of goodness of fit.
7	Testing of independence of attributes.
8	Testing of significance and confidence intervals of an observed sample correlation
	Coefficient.
9	Testing confidence intervals of equality of two population variances.
10	Study on Regression Analysis

# **CO- PO Mapping:**

Semester 2		Advanced Statistical Methods									
	POs										
Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	2	1	3	-	-	-	-	-	-
CO2	3	3	3	2	3	-	-	-	-	-	-
CO3	3	3	3	2	3	-	-	-	-	-	-
CO4	3	2	2	3	3	-	-	-	-	-	-

Legend: '3' for high, '2' for medium, '1' for low and '-' for no correlation of each CO with PO.

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