

AC –  
Item No. –

**As Per NEP 2020**

**Tolani College of Commerce (Autonomous)**



Knowledge is Supreme

## Title of the Course: Sampling Distributions

Syllabus for Four credit Course-From the Academic Year- 2024-2025

Name of the Course: Statistics Minor: Semester IV- Sampling Distributions

Programmes:

<b>Bachelor of Management Studies</b>
<b>Bachelor of Commerce (Accounting &amp; Finance)</b>
<b>Bachelor of Commerce (Banking &amp; Insurance)</b>
<b>Bachelor of Commerce (Financial Markets,</b>
<b>Bachelor of Science (Information Technology)</b>

Sr. No.	Heading	Particulars
1	<b>Description the course:</b>	Sampling distributions are fundamental in inferential statistics, where they serve as the basis for making inferences about population parameters from sample data. Sampling distributions are applied in various fields, including market research, public opinion polling, quality control, epidemiology, and experimental design. Sampling distributions are closely connected with other branches of statistics, including probability theory, hypothesis testing, estimation theory, and regression analysis.
2	<b>Vertical :</b>	Minor
3	<b>Type :</b>	Theory / Practical
4	<b>Credit:</b>	4 credits ( 2 credit = 30 Hours for Theory or 30 Hours of Practical work in a semester )
5	<b>Hours Allotted :</b>	60 Hours
6	<b>Marks Allotted:</b>	100 Marks (60 (SE) + 40(CE))

7	<b>Course Objectives:</b> <ol style="list-style-type: none"> <li>1. Define fundamental concepts related to sampling distributions</li> <li>2. Defining population, sample, parameter, statistic, and sampling variability</li> <li>3. Introduce different types of sampling distributions, such as the sampling distribution of the sample mean,</li> <li>4. Introduction of the sample proportion, sample variance, and other sample statistics.</li> </ol>	
8	<b>Course Outcomes:</b> <ol style="list-style-type: none"> <li>1. Students will be proficient in estimating population parameters and constructing confidence intervals using sample statistics</li> <li>2. Students will be able to understand the sampling distributions.</li> <li>3. Students will be able to conduct hypothesis tests based on sampling distributions,</li> <li>4. Specifying null and alternative hypotheses, calculating test statistics, and interpreting results</li> </ol>	
9	<b>Modules:-</b>	
	<b>Module 1: Tests of Significance (15 Hours)</b> <ul style="list-style-type: none"> <li>● Definitions of Null Hypothesis, Alternate Hypothesis</li> <li>● Types of Errors, Type I , Type II Errors</li> <li>● One Tailed, Two Tailed Tests</li> <li>● Level of Significance, 1%, 5% Level of Significance</li> </ul>	
	<b>Module 2: Confidence Interval (15 Hours)</b> <ul style="list-style-type: none"> <li>● Critical Region, Confidence Interval</li> <li>● Standard Error, t distribution</li> <li>● Confidence interval for mean</li> <li>● Difference between the Means, Concept of Degrees of Freedom</li> </ul>	
	<b>Module 3: Sampling Distributions (15 Hours)</b> <ul style="list-style-type: none"> <li>● Chi Square Distribution, Degrees of Freedom</li> <li>● Confidence Interval for the Variance of a Normal Population, Test for Independence of Attributes, Yates Correction</li> <li>● F Distribution</li> <li>● Mean, Mode and Standard Deviation of F Distribution</li> </ul>	
	<b>Module 4: Sampling Distributions II (15 Hours)</b> <ul style="list-style-type: none"> <li>● Reciprocal of F Variate</li> <li>● Interrelationship between t distribution, Chi square and Normal distribution</li> <li>● Confidence Interval for Ratio of Variances of Two Independent Normal Populations</li> <li>● Test of Equality of Variances of Two Independent Normal populations</li> </ul>	
10	<b>Reference Books</b> <ul style="list-style-type: none"> <li>● Gupta, S.P. Statistical Methods. S. Chand &amp; Co., 2021.</li> <li>● Gupta, S.C., and V.K. Kapoor. Fundamentals of Mathematical Statistics.</li> <li>● Agrawal, S.K. Theory of Probability Distributions. Bhaskar Publications.</li> <li>● Singh, Rajeshwar. An Introduction to Probability and Distributions. Books &amp; Allied Ltd.</li> <li>● Murthy, M.N. Sampling Theory and Methods. Statistical Publishing Society.</li> </ul>	
11	<b>Internal Continuous Assessment: 40%</b>	Semester End Examination : 60%
12	<b>Continuous Evaluation through:</b>	Assignment /Periodical Test
13	<b>Format of Question Paper:</b> Q. 1 Attempt any Three (15 marks) a.	

	b. c. d. Q. 2 Attempt any Three (15 marks) a. b. c. d. Q. 3 Attempt any Three (15 marks) a. b. c. d. Q. 4 Attempt any Three (15 marks) a. b. c. d.
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**Signatures of Team Members**

Sr.No	Name	Signature
1.	Ms. Shubha Chaubal	
2.	Ms. Priyanka Malvankar	



11	<b>Reference Books:</b> 1. T. M Apostol, Calculus, Wiley & Sons Pvt Ltd. 2. Ghorpade, Limaye, A course in Calculus and Real Analysis, Springer International Ltd 3. Ajit and Kumaresan, A Basic Course in Real Analysis, CRC Press 4. Shanti Narayan and Mittal, A Course in Mathematical Analysis, S. Chand and Co.	
12	<b>Internal Continuous Assessment: 40%</b>	<b>Semester End Examination : 60%</b>
13	<b>Continuous Evaluation through:</b>	
14	<b>Format of Question Paper:</b> for the final examination	

### Signatures of Team Members

Sr.No	Name	Signature
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