

Department of Liberal Education
Era University, Lucknow
Course Outline
Effective From: 2023-24

Name of the Program	B.A. / B.Sc. (LIBERAL EDUCATION)			Year/ Semester:	2nd / 4th
Course Name	Testing of Hypothesis	Course Code:	ST202	Type:	Theory
Credits	05			Total Sessions Hours:	75 Hours
Evaluation Spread	Internal Continuous Assessment:	50 Marks		End Term Exam:	50 Marks
Type of Course	<input type="radio"/> Compulsory	<input checked="" type="radio"/> Core	<input type="radio"/> Creative	<input type="radio"/> Life Skill	
Course Objectives	<ol style="list-style-type: none"> This course attempts to create awareness among students about a few most frequently used sampling distributions that manage to correlate it with practical situations. It will teach students to review every decision making problems around them in the light of hypothesis testing and identify the most suitable testing strategy to reach an optimal and valid conclusion. It will cover concepts such as parametric testing and non-parametric testing, large sample test for mean and proportion, exact sample tests for mean and variance and their applications in real life in multiple disciplines. 				
Course Outcomes (CO): <i>After the successful course completion, learners will develop following attributes:</i>					
Course Outcome (CO)	Attributes				
CO1	Student will learn about the basic concept of sampling distributions of different types and their applications.				
CO2	Students will have knowledge of the terms like null and alternative hypotheses, two-tailed and one tailed, alternative hypotheses, type 1 error and type 2 error, level of significance and confidence, p value.				
CO3	Students will develop the ability to understand under what situations one would conduct the large sample tests (in case of one sample and two sample tests).				
CO4	Students will be familiar with one sample and two sample test related to t-test, F-test, Chi Square test and their use in real/daily life scenarios.				
Pedagogy	Interactive, discussion-bases, student-centered, presentation.				
Internal Evaluation Mode	Mid-term Examination: 20 Marks Activity: 10 Marks Class test: 05 Marks Online Test/Objective Test: 05 Marks Assignments/Presentation: 05 Marks Attendance: 05 Marks				
Session Details	Topic			Hours	Mapped CO
Unit 1	Sampling Distributions, Parameter, Statistic and Standard error. Sampling distribution of Z, t, f, and chi-square without derivations, Simple properties of these distributions and their interrelationship			15	CO1

	(without proof). Activity: Compute standard deviation of sample means of multiple samples.		
Unit 2	Statistical Hypothesis (Null and Alternative), Simple and Composite hypothesis, One sided and two sided hypothesis, Decision matrix, Type –I and Type – II errors, Significance level, p-value, critical region, acceptance region, degree of freedom, power of test. Activity: Making models of real life scenarios of Testing of Hypothesis.	20	CO2
Unit 3	Test of significance: Large sample tests for (Attributes and Variables) proportions and means for one sample and for two samples. Testing of Correlation coefficient. Activity: Testing correlation between BMI and TSH level using data.	20	CO3
Unit 4	Tests based on exact sampling distributions for small samples: Testing equality of means using one sample t- test, two sample independent t- test (for equal variances) and paired t-test. F-test for equality of variance, and chi-square tests for goodness of fit and independence of attributes. Activity: Testing Association of attributes between gender and opinion about PTM (Parents teacher meeting)	20	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1		1							1					
CO2			2	1		2					1			
CO3	2		1	1		2	2			1		1		
CO4	1	1				2	3			2	1	3	1	

Strong contribution-3, Average contribution-2, Low contribution-1,

Suggested Readings:

Text- Books	1. Goon, A.M., Gupta, M.K. and Dasgupta, B. (2013). Fundamental of Mathematical Statistics, Vol I, World Press, Kolkata. 2. Mood A.M., Graybill F.A. and Boes D.C. (2007). Introduction to the Theory of Statistics (3rd ed.), New Delhi , Tata McGraw Hill Publishing Co. ltd.
Reference Books	1. Gupta, S.C. and Kapoor, V.K. (2000). Fundamentals of Mathematical Statistics (10th ed.), Sultan Chand and Sons. 2. Hogg, R.V., McKean, J.W. & Craig, A.T. (2009). Introduction to Mathematical Statistics (6 th ed.), Pearson.
Para Text	Unit 1: 1. https://www.youtube.com/watch?v=3GD5zVgvD2Q 2. https://www.youtube.com/watch?v=N6WPyKzLyCY Unit 2: 1. https://www.youtube.com/watch?v=VK-rnA3-41c 2. https://www.youtube.com/watch?v=UXV-A0Zo1Jk Unit 3: 1. https://www.youtube.com/watch?v=ChLO7wwt7h0 2. https://www.youtube.com/watch?v=DlwOTOydeyk Unit4: 1. https://www.youtube.com/watch?v=ie-MYQp1Nic 2. https://www.youtube.com/watch?v=HKDqlYSLt68

Recapitulation & Examination Pattern		
Internal Continuous Assessment:		
Component	Marks	Pattern
Mid Semester	20	Section A: Contains 10 MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries 0.5 mark . Section B: Contains 07 descriptive questions out of which 05 questions are to be attempted. Each question carries 03 marks .
Activity	10	Will be decided by subject teacher
Class Test	05	Contains 05 descriptive questions . Each question carries 01 mark.
Online Test/ Objective Test	05	Contains 10 multiple choice questions . Each question carries 0.5 mark.
Assignment/ Presentation	05	Assignment to be made on topics and instruction given by subject teacher
Attendance	05	As per policy
Total Marks	50	

Course created by: **Dr. Nazia Naqvi**
Dr. Abdul Quddoos

Signature:

Approved by: **Prof. Shashi Bhushan**

Shashi Bhushan

Signature: