

**GUJARAT UNIVERSITY**  
**NEP-2020**  
**B. A. (HONS)**  
**SEMESTER – VI (MINOR)**  
**TESTING OF HYPOTHESIS**  
**COURSE CODE – DSC-M-STAT-364**  
**CREDIT MARK DISTRIBUTION – 04**

**COURSE OBJECTIVES**

- To understand the fundamental concepts of Statistical Inference and logic behind hypothesis testing.
- To develop the ability to formulate Statistical Hypothesis related to real-life situations.
- To develop the skill for selecting appropriate statistical test based on formulated hypothesis and collected data.
- To gain proficiency in performing and interpreting various statistical tests like Z-test, t-test, F-test and Chi square test.
- To enhance analytical and critical thinking skills for making data-based decisions through hypothesis testing.

**PREREQUISITE**

- Basic knowledge of Descriptive Statistics (Mean, Variance, Correlation etc.)
- Understanding of Probability distributions like Normal, t, Chi-square and F.
- Knowledge of Sampling methods.
- Ability to perform basic mathematical and algebraic calculations.

**COURSE OUTCOMES**

Upon successful completion of the course, students will be able to:

- Explain the concepts of Null and Alternative Hypothesis, test statistics, Type-I Error and Type – II Error, Critical region, Level of Significance.
- Develop the ability to formulate Null and Alternative Hypothesis related to real-life problems.
- Identify and apply appropriate parametric tests like Z-test, t-test, F-test and Chi-Square test to real-life problems.
- Interpret the test results and derive statistical conclusions effectively.

<b>UNIT</b>	<b>CONTENT</b>	<b>WEIGHTAGE</b>
<b>1</b>	<b>Basic Concepts of Hypothesis</b>	<b>25%</b>

	<ul style="list-style-type: none"> <li>➤ Parameter and Statistics.</li> <li>➤ Sampling distribution, Standard Error of statistics,</li> <li>➤ Statistical Hypothesis (Null and Alternative Hypothesis)</li> <li>➤ Type- I Error and Type – II Error</li> <li>➤ Level of Significance, Degrees of freedom, Critical Region</li> </ul>	
<b>2</b>	<p><b>Large Sample Test (Z-test)</b></p> <ul style="list-style-type: none"> <li>➤ Definition of Z-test.</li> <li>➤ Test of significance for variables.</li> <li>➤ Test of significance of mean and difference between two means.</li> <li>➤ Test of significance for attributes</li> <li>➤ Test of significance of a proportion of success and Test of significance of difference between two proportions.</li> <li>➤ Examples based on above topics with simple and moderate level of difficulty.</li> </ul>	<b>25%</b>
<b>3</b>	<p><b>Small Sample Test</b></p> <p><b>t - test</b></p> <ul style="list-style-type: none"> <li>➤ Definition of t-test.</li> <li>➤ Test of significance of mean and difference between two means.</li> <li>➤ Paired t test</li> <li>➤ Test of Correlation Coefficient.</li> <li>➤ Examples based on above topics with simple and moderate level of difficulty.</li> </ul> <p><b>F-test</b></p> <ul style="list-style-type: none"> <li>➤ Definition of F-test.</li> <li>➤ Test of signification of single population variance and difference between two variances.</li> <li>➤ Examples based on above topics with simple and moderate level of difficulty.</li> </ul>	<b>25%</b>
<b>4</b>	<p><b>Chi-Square Test</b></p> <ul style="list-style-type: none"> <li>➤ Concept and Definition of Chi-Square Test</li> <li>➤ Purpose of Chi-Square Test</li> <li>➤ Test of Goodness of Fit</li> <li>➤ Test of Independence of Attributes</li> <li>➤ Contingency tables: 2×2 and larger tables</li> <li>➤ Examples based on above topics with simple and moderate level of difficulty.</li> </ul>	<b>25%</b>

### **MODE OF EVALUATION**

Evaluation will be divided in two parts.

- **External:** Semester end Examination will be conducted by the Gujarat

University of 50 Marks

- **Internal:** Internal Evaluation of 50 marks will be decided by the colleges / Institutes/ University departments as per the instruction given by the University.

**FBLD (Flip Blended Learning Design Template)**

- Any One Unit from the above syllabus can be discussed by the faculty through online mode.
- Online mode can be SWAYAM MOOC Course or any other suggested by the UGC or Gujarat University.

**REFERENCE BOOKS**

1. "Fundamental of Applied Statistics" by S. C. Gupta & V. K. Kapoor, published by Sultan Chand & Sons, New – Delhi.
2. "Statistics Theory, Methods and Applications" by D. C. Sancheti & V.K.Kapoor, published by Sultan Chand & Sons.
3. "Statistical Inference: Testing of Hypothesis" by Srivastava & Srivastava, published by PHI learning.
4. "Statistical Inference" by Rajagopalan, published by Prentice Hall India.
5. "Estimation and Inferential Statistics" by Pradip K. Sahu, Santi Ranjan Pal & Ajit K. Das, published by Springer India.
6. "Testing Statistical Hypothesis" by E. L. Lehmann, Joseph P. Romano, published by Springer.