

Course Title:	<b>Categorical Data Analysis</b>
Course Code:	<b>BSTA-203</b>
Semester:	<b>IV</b>
Credit Hours:	<b>03</b>

## Learning Outcomes

By the end of this course, students will be able to:

1. know the nature of categorical variables and their measurement scales.
2. ascertain the knowledge of sampling distributions for categorical variables and learn the methods of testing hypothesis with applications.
3. learn various tools and techniques to analyze categorical data and their applications to the real-world problems of medicine.

## Course Outline

### Unit – I

#### 1.1 Categorical Data and its Sampling Distributions

Introduction, Categorical Response Data, Distributions for Categorical Data: Binomial, Multinomial, Poisson. Statistical inference for Multinomial Parameters.

#### Contingency Tables and Association Measures

Contingency Table, Probability Structure for Contingency Table, Conditional Stratified Association in 2 x 2 Tables, Measuring Associations in I x J Tables. Two-way Tables for Ordered Classifications. Measures of Agreement between Categorical Variables: Cohen's Kappa ( $\kappa$ ), McNemar's Test, Kendall's Tau b, Fleiss' Kappa for Multiple Raters, Krippendorff's Alpha.

### Unit – II

#### Categorical Response Models

Logistic Regression Models: Binary, multinomial, and ordinal with theory and Applications. Goodness of Fit Tests: Wald Test, Hosmer-Lemeshow Test, Classification Tree.

- **Teaching-learning Strategies:**

Class Lecture method, which includes seminars, discussions, assignments and projects. (Audio-visual tools are used where necessary)

- **Assignments-Types and Number with calendar:**

According to the choice of respective teacher.

- **Assessment and Examinations:**

According to the University's Semester Rules.

Sr. No.	Elements	Weightage	Details
---------	----------	-----------	---------

1.	Midterm Assessment	35%	It takes place at the mid-point of the semester.
2.	Formative Assessment	25%	It is continuous assessment. It includes: Classroom participation, attendance, assignments, and presentations, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

**Textbooks:**

1. Agresti, A. (2012). *Categorical data analysis* (3<sup>rd</sup> ed.). John Wiley & Sons.
2. Lloyd, C. J. (2019). *Statistical analysis of categorical data* (2<sup>nd</sup> ed.). John Wiley & Sons.

**Suggested Readings:**

1. Agresti, A. (2010) *Analysis of Ordinal Categorical Data* (2<sup>nd</sup> ed.). John Wiley & Sons.
2. Leonard, T., & Papasouliotis, O. (2000). *A course in categorical data analysis*. Boca Raton, Fla: Chapman & Hall/CRC Press.

Powers D. A., & Xie Y. (2008). *Statistical Methods for Categorical Data Analysis* (2<sup>nd</sup> ed.). Emerald Group Publishing.