Module Code:	STAT-416
Module Title:	Categorical Data Analysis – 3 credit Hours
Name of Scheme:	BS Statistics

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 examples.

Course Outlines

1.1 Introduction

Historical background of categorical response data. Types of categorical variables, measurement scales distinction and sampling distributions. Testing goodness of fit and independence. Large sample confidence intervals and the idea of p-value.

1.2 Different Test statistics

Chi-square Test for Categorical Data, its Assumptions and Applications, Phi Co-efficient, Contingency Co-efficient (C), Cramer's-V, Adjusted Chi-square (Yates' Correction), Fisher's Exact Test (An Exact Test for (2x2) Contingency Table), Kendall's Tau b Statistic. Cochran-Mantel-Haenszel Test, Matched Samples and McNemar Test. Meta-Analysis for (2x2xk) Tables.

2.1 Testing of Statistical Significance

Testing of Statistical Significance of Relative Risk and Odds Ratio with its Confidence Limits, Sensitivity, Specificity and Kappa Statistic.

2.2 Model building

Models for Binary Response Variables, Log Linear Models and Fitting of Log-linear and Logit Models, Binomial and Normal Probability Plots.

Text Book

1. Agresti, A. (2012). *Categorical data analysis* (3rd ed.). John Wiley & Sons.

Suggested Readings

1. Lloyd, C. J. (1999). *Statistical analysis of categorical data* (1st ed.). John Wiley & Sons.
2. Powers D. A., & Xie, Y. (2008). *Statistical Methods for Categorical Data Analysis* (2nd ed.). Emerald Group Publishing.