Appendix-12 Resolution No. 39-1-9

MCAE204 Statistical Methods

<u>Course Objectives</u>: To equip students with the skills necessary to apply statistical methods for various applications.

Course Learning Outcomes:

On completing this course, the student will be able to:

CO1: apply descriptive statistical techniques to summarize and interpret data **CO2:** apply inferential statistical methods, including hypothesis testing and confidence interval estimation.

CO3: perform and interpret simple and multiple linear regression analysis

CO4: apply principles of experimental design in the context of a problem

Syllabus:

Unit-1 Introduction: Descriptive statistics: measures of central tendency and variability, representation of data: stem and leaf diagram, histogram, boxplot, and ogive; bar diagram and its variations, Pie charts; probability distributions: discrete and continuous, joint and conditional probability; theory of attributes: coefficient of association and coefficient of colligation.

Unit-II: Statistical Inference: Parameter and statistic; sampling distributions, confidence intervals and margin of error, hypothesis testing; non-parametric inference: non-parametric tests: Mann-Whitney U test, Kruskal-Wallis test, Spearman's rank correlation coefficient.

Unit-III Regression and Classification: Correlation: measure and significance, simple linear regression, multiple linear regression, one-way classification, analysis of variance, two-way classification, analysis of covariance, curvilinear regression, factorial experiments.

Readings

- 1. Robert S. Witte and John S. Witte, Statistics, John Wiley & Sons Inc; 11th edition, 2021
- 2. Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani, An Introduction to Statistical Learning, Springer, 2023.
- 3. G. W. Snedecor, W. G. Cochran, Statistical Methods, Iowa State University Press, 1973
- 4. John A. Rice, Mathematical Statistics and Data Analysis, Cengage, 2013