THM-301: STATISTICS-I (THEORY) (02 Credit hrs)

PRE-REQUISITE

THM-109 Mathematics

COURSE OUTCOMES:

After Completion of this course the students will be able to:

1. Calculate and apply most measures of central tendency.
2. Apply discrete and continuous probability distributions to most business problems.
3. Perform test of hypothesis and calculate confidence interval for a population.
4. Compute most of the results of bivariate and multivariate correlation and regression

COURSE INTRODUCTION AND OBJECTIVES:

Syllabus Outline

This course provides an introduction to the statistical theories, flood frequency analysis and probability theories and their applications in hydrology. This course will also provide an correlation and regression analyses as well as hypothesis testing.

Theory

Module-1 Introduction and Basic Concepts

- Introduction to Statistics and definitions
- Applications of Statistics in Tourism and Hospitality Management
- Statistical presentation of data
- Consistency and homogeneity of data
- Probability and Axioms of Probabilities
- Properties of Random Variable

Module-2 Statistical Analysis of Data

- **M**easures of central tendency, dispersion and symmetry.
- Expectation and estimation.
- Discrete and continuous probability distributions, especially normal and extreme-value distributions.

Module-3 Frequency Analysis

- Return Period
- Extreme Value Distributions
- Frequency Analysis using Frequency Factors
- Probability Plotting
- Confidence Limits

Module-4 Correlation and Regression

- Correlation Analysis, Serial or Auto-Correlation, Cross-Correlation, Inferences on Correlation Coefficient, Kendall's Rank Correlation Test
- Simple Linear Regression, Estimation of Parameters, Goodness of Regression
- Multiple Linear Regression, Estimation of Parameters, Goodness of Regression

Module-5 Hypothesis Testing

- The t-distribution
- Chi-Square Distribution
- Tests Concerning Variances of Two Populations

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS:

Sr. No.	Elements		Details
1.	Mid Term Assessment		It takes place at the mid-point of the semester
2.	Formative Assessment		It is continuous assessment. It includes: classroom participation, attendance, assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment		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.

RECOMMENDED TEXT BOOKS & SUGGESTED READINGS:

1. Harvey J. E. Rodda, Max A. Little2016. *Understanding Mathematical and Statistical Techniques in Hydrology an Examples-based Approach* 1st Edition Wiley-Blackwell
2. Maity R., (2018). *Statistical Methods in Hydrology and Hydro climatology (Springer Transactions in Civil and Environmental Engineering) 1st ed*Springer
3. Haan, C.T., (2002) *Statistical Methods in Hydrology, 2nd edition*, Iowa State Press,
4. Maity, R. (2018). *Statistical methods in hydrology and hydroclimatology*. Springer.
5. Chatfield, C. (2018). *Statistics for technology: a course in applied statistic*s. Routledge.
6. McCuen, R. H. (2016). *Modeling hydrologic change: statistical methods*. CRC press.
7. Rodda, H. J., & Little, M. A. (2015). *Understanding mathematical and statistical techniques in hydrology: an examples-based approach*. John Wiley & Sons.