Minnesota State University Moorhead

MATH 435: Mathematical Statistics I

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: 4

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites:
This course requires both of these prerequisites
MATH 323 - Multi-Variable and Vector Calculus
MATH 311 - Introduction to Proof and Abstract Mathematics

Corequisites: None

MnTC Goals: None

Discrete and continuous probability distributions, marginal and conditional densities, moment generating functions, transformations, and limiting distributions. Sampling distributions, parametric point estimation and tests of hypotheses.

B. COURSE EFFECTIVE DATES: 05/04/1999 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Discrete probability mass functions and Cumulative distribution functions (Bernoulli, Binomial, Uniform, Poisson, Hypergeometric, Geometric, Negative Binomial, and Multinomial)
2. Continuous probability density functions and Cumulative distribution functions (Uniform, Exponential, Normal, Gamma, Log Normal, and Beta)
3. Expectation, Mean variance and moment generating function
4. Bivariate distributions
5. Joint, conditional, and marginal distributions
6. Conditional expectation
7. Transformations: univariate and multivariate
8. Limiting distributions
9. Sampling distributions: Central limit theorem
10. Point and Interval estimation for the mean of a population
11. Tests of hypotheses for the mean of a population

D. LEARNING OUTCOMES (General)

1. Learn the mathematical derivations of properties of probability distributions
2. Work with a variety of discrete and continuous distributions that can be used as models for real world problems and applications
3. Learn the mathematical treatment of distributions of higher dimensions

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted