

Minnesota State University Moorhead

MATH 436: Mathematical Statistics II

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: *.*

Prerequisites:

This course requires the following prerequisite

MATH 435 - Mathematical Statistics I

Corequisites: None

MnTC Goals: None

Students will learn the theoretical aspects of estimation and hypotheses testing procedures, and their applications.

B. COURSE EFFECTIVE DATES: 02/02/2019 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Explain the concepts of random sampling, statistical inference and sampling distribution, and state and use basic sampling distributions.
2. Describe the main methods of estimation and the main properties of estimators, and apply them. Methods include matching moments, percentile matching, and maximum likelihood, and properties include bias, variance, mean squared error, consistency, efficiency, and UMVUE.
3. Construct confidence intervals for unknown parameters, including the mean, differences of two means, variances, and proportions.
4. Test hypotheses. Concepts to be covered include Neyman-Pearson lemma, significance and power, likelihood ratio test, and information criteria. Tests should include for mean, variance, contingency tables, and goodness-of-fit.

D. LEARNING OUTCOMES (General)

1. Understand the mathematical derivations of limiting distributions.
2. Be able to derive maximum likelihood and other estimators.
3. Be able to derive the uniformly minimum variance unbiased estimator.
4. Be able to construct exact and approximate confidence intervals.
5. Understand the mathematical treatment of hypotheses testing procedures.

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

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted