

Statistics

College of Science, Engineering, & Technology
Department of Mathematics & Statistics
273 Wissink Hall • 507-389-1453
Web site: www.mnsu.edu/dept/mathstat/

Chair: Larry Pearson

Mezbahur Rahman

Statistics in this department is designed to provide a basic theoretical background for statistical inference and some techniques and practice in applying the theory. Courses in statistics would be useful for anyone as a tool in another area of study or as preparation for more advanced study of statistics.

STATISTICS MINOR

Required for Minor (20-21 credits):

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|---------------------------------------|--|
| MATH 121 | Calculus I (4) |
| MATH 122 | Calculus II (4) |
| STAT 354 | Concepts of Probability and Statistics (3) |
| STAT 450 | Regression Analysis (3) |
| STAT 451 | Experimental Designs (3) |
| Choose one course from the following: | |
| STAT 357 | Sample Survey and Design (3) |
| STAT 358 | Categorical Data Analysis (3) |
| STAT 359 | Nonparametric Methods (3) |
| STAT 455 | Theory of Statistics I (4) |

POLICIES/INFORMATION

GPA Policy. Statistics minors must earn a grade of C or better in all courses applied to the minor.

P/N Grading Policy. All 300- and 400-level courses are offered for grade only with the exception of STAT 498 and 499 which is available for both P/N and letter grade.

Credit by examination. Will not be approved for courses in which a student has already received a grade.

Credit Limitation. A student may not receive credit for STAT 354 after completing MATH 455 or STAT 455.

COURSE DESCRIPTIONS

STAT 154 (3) Elementary Statistics

Basic descriptive measures of data, elementary probability concepts and their relation to statistical inference, tests of hypotheses and confidence intervals. An appropriate preparation for more advanced statistics courses in any area.

Pre: Three years high school algebra or MATH 098
F, S GE-4

STAT 354 (3) Concepts of Probability & Statistics

This is a calculus-based course covering introductory

level topics of probability and statistics. It is designed to meet the needs of both the practitioner and the person who plans further in-depth study. Topics include probability, random variables and probability distributions, joint probability distributions, statistical inference (both estimation and hypothesis testing), analysis of variance, regression, and correlation. Same as MATH 354.
Pre: MATH 122 F, S

STAT 357 (3) Sample Survey and Design

Random sampling, systematic sampling methods including stratified random sampling, cluster sampling and two-stage sampling, ratio estimation, regression, and population size estimation.
Pre: elementary STAT course or consent ALT-F

STAT 358 (3) Categorical Data Analysis

Forms of multivariate analysis for discrete data, two dimensional tables, models of independence, log linear models, estimation of expected values, model selection, higher dimensional tables, logit models and incompleteness.
Pre: elementary STAT course or consent ALT-F

STAT 359 (3) Nonparametric Methods

Derivation and usage of nonparametric statistical methods, applications in count and rank data, analysis of variance for ranked data, statistical quality control.
Pre: any STAT course

STAT 450 (3) Regression Analysis

Simple and multiple regression, correlation, analysis of variance and covariance.
Pre: MATH/STAT 354 or 455 ALT-S

STAT 451 (3) Experimental Designs

Completely randomized, randomized block, fractional factorial, incomplete block, split-plot, Latin squares, expected mean squares, response surfaces, confounding, fixed effects and random effects models.
Pre: MATH/STAT 354 or 455 ALT-S

STAT 455 (4) Theory of Statistics I

A mathematical approach to statistics with derivation of theoretical results and of basic techniques used in applications. Includes probability, continuous probability distributions, multivariate distributions, functions of random variables, central limit theorem and statistical inference. Same as MATH 455.
Pre: MATH 223 F

STAT 456 (4) Theory of Statistics II

A mathematical approach to statistics with derivation of theoretical results and of basic techniques used in applications, including sufficient statistics, additional statistical inference, theory of statistical tests, inferences about normal models and nonparametric methods. Same as MATH 456.
Pre: MATH/STAT 455

STAT 488 (1-3) Seminar

The study of a particular topic primarily based upon recent literature. May be repeated for credit on each new topic.

STAT 491 (1-4) In-Service

A course designed to upgrade the qualifications of persons on-the-job. May be repeated for credit on each new topic.

STAT 495 (1-4) Selected Topics

A course in an area of statistics not regularly offered. May be repeated for credit on each new topic.

STAT 498 (1-12) Internship

Provides a student the opportunity to gain expertise and experience in a special field under the supervision of a qualified person.

STAT 499 (1-4) Individual Study

Independent individual study under the guidance and direction of a faculty member. Special arrangements must be made with an appropriate faculty member. May be repeated for credit of each new topic.