Course Information Form (CIF)

Course Code: MAT 160 (IAI M1 902)
Course Title: Statistics

Department: Mathematics
PCS Code: 1.1 - Baccalaureate/Transfer
CIP Code: 27.0501
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 4-0-4
Credit Hour Distribution:

Lecture: 4	Lab: 0	Clinical: 0	**Total: 4**

General Course Information

Catalog Description

Data organization, distributions, measures of central tendency and variability, probability, sampling, the normal distribution, expected value, estimation, hypothesis testing, chi square analysis, analysis of variance, regression, correlation, nonparametric methods, and applications to business, social science, and life science. Credit not given for both MAT 108 and MAT 160.

General Course Objectives

Students will be able to analyze data and draw inferences from that analysis. The students will further develop their skills in problem solving, quantitative reasoning, and the use of technology.

Minimum Placement Levels

English	Reading	Math
None	None	None

Prerequisites

Credit in MAT 124 with a grade of C or higher, or placement

Methods of Evaluation

4-5 examinations, 8-30 quizzes/assignments, and a cumulative final exam.

Instructional Materials and Additional Supplies

Elementary Statistics, by Navidi and Monk: 2025 Release Looseleaf; 4th edition, 2025, 2025 978-1-2669-3662-3 - Print Text
Introductory Statistics, by Illowsky and Dean; OpenStax, Digital 2022 ISBN 13: 978-1-961584-32-7 - Online Content
Required: TI-84 Plus graphing calculator; $85-$120.

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Definition of Basic Terms	1. Explain the difference between a population parameter and a sample statistic. 2. Describe an inferential statistic. 3. Describe a designed experiment and observational study. 4. Describe qualitative and quantitative, discrete and continuous and the different sampling techniques.	2	0	0
Graphical Representations	1. Construct a frequency table and an appropriate graphical representation (Pareto diagram, histogram, etc.) for both qualitative and quantitative data. 2. Identify distribution shapes such as uniform, skewed, and bell-shaped.	5	0	0
Measures of Central Tendency	1. Compute a mean, median, and mode for raw data and an estimate for the mean for grouped data. 2. Find the modal class for grouped data. 3. Use 1-var stats on a TI-84 Plus calculator to compute the mean and median from raw data and an estimate for the mean from grouped data.	2	0	0
Measures of Central Variation	1. Compute the range, variance and standard deviation for raw data and an estimate for the standard deviation from grouped data. 2. Use 1-var stats on a TI-84 Plus calculator to compute the range and standard deviation from raw data and an estimate for the standard deviation from grouped data.	2	0	0
Boxplots	1. Construct both boxplots and modified boxplots on the TI-84 Plus calculator. 2. Compute the five-number summary for a set of data. 3. Identify possible outliers.	2	0	0
Concepts of Probability	1. Compute probabilities using both the classical and relative frequency approach. 2. Use addition and complementation rules to find other probabilities of interest.	2	0	0
Discrete Probability Distributions	1. Compute the mean and standard deviation of all the random variable X given its probability distribution. 2. Use the 'binomcdf' to compute probabilities for a binomial random variable.	4	0	0
Continuous Probability Distributions	1. Explain the difference between a discrete and continuous distribution. 2. Use 'normalcdf' to compute probabilities for the normal random variables x and x-bar. 3. Use 'invNorm' to compute values of x for normal random variables x and x-bar. 4. State the Central Limit Theorem.	6	0	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Point and Interval Estimates	1. Compute both point and interval estimates for the population mean, proportion, and standard deviation (optional). 2. Compute the needed sample size for estimating the population mean or proportion with a given level of precision.	5	0	0
Hypothesis Testing	1. Explain the difference between Type I and Type II errors and between left-tailed, right-tailed and two-tailed tests. 2. Perform a five-step hypothesis testing procedure using a single sample to test a parameter using z-test, t-test, 1-Prop Z-test, or Chi-Square Test for a standard deviation (optional). 3. Perform a five-step hypothesis testing procedure using two samples to compare two parameters using 2-Sample Z-Test, pooled 2-sample t-test, nonpooled 2-sample t-test, paired t-test, 2-Sample F-test or 2-Prop Z-test, and a nonparametric test of the instructor's choosing. 4. Interpret what the p-value is measuring for a given problem. 5. Pick an appropriate and most powerful test for a given set of sample data.	12	0	0
Chi-Square Procedures	1. Perform a chi-square goodness-of-fit test. 2. Perform a chi-square independence test.	2	0	0
Linear Regression	1. Compute and interpret the linear correlation coefficient and construct a scatterplot for bivariate data. 2. Perform a five-step hypothesis testing procedure to test for linear correlation. 3. Predict values of Y given X and interpret the slope of the regression equation. 4. Find the linear regression equation for a set of linearly related bivariate data. 5. Compute a confidence interval for y given x and a prediction interval for y given x. 6. Compute the coefficient of determination and interpret its value.	5	0	0
Analysis of Variance	1. Perform an ANOVA test on K samples of data. 2. Determine from the result of the ANOVA test whether further multiple comparisons are needed or not.	2	0	0
Review and Tests	1. Earn at least a 70 percent on each of four hour exams and the final exam.	9	0	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
60	0	0