

## Course Overview: MAT 216

<b>Course title:</b> Statistical Data Analysis
<b>Pre-requisites:</b> LAC student with T1M or ELAC student with LACM or SAT 550+ (At the high school level, teachers may use their discretion to place students in this course. PSAT scores and past math coursework may be useful indicators.)
<b>Number of credits:</b> 3
<b>Catalog course description:</b> Multidisciplinary, data-driven course in applied statistics. Topics selected from exploratory data analysis (tables, graphs, central tendency and variation), correlation and regression, probability and statistical inference (confidence intervals and hypothesis testing). Emphasis placed on interpretation and analysis of real-data sets. Use of statistical computing software is integral to the course.
<b>Required instructor qualifications:</b> Master's degree in mathematics or a related field (e.g., Mathematics Education). Applicants with Master's in a scientific field will be considered if they have experience teaching math.
<b>Course's audience and role in Eastern's curriculum:</b> This course is one of the core course options in the Data Science major. It is also included in the Health Science major, the Business Administration major and minor, the Bioinformatics minor, the Environmental Earth Science major, the Genetic Counseling minor, the Business Information Systems major, and the Computer Science major.
<b>Learning outcomes:</b> Different instructors of this course phrase their learning outcomes differently, so feel free to customize the phrasing. Your outcomes might include the following: <ul style="list-style-type: none"><li>• Students will use data visualization to summarize a variable and describe its behavior.</li><li>• Students will be able to use the mean, five-number summary, standard deviation, interquartile range, and z-scores to describe a variable and identify if it's an outlier.</li><li>• Students will apply knowledge of probability rules-- including conditional probability, Binomial distributions, and Normal distributions -- to describe how variables behave.</li><li>• Students will describe the difference between the probability distribution of an individual and the sampling distribution for a sample average or sample proportion and correctly identify when they cannot use the tools of this course to find the sampling distribution.</li><li>• Students will estimate the value of a parameter using a confidence interval and discuss whether the interval is valid or not.</li><li>• Students will evaluate whether a hypothesis test is appropriate, and if so test a hypothesis about a parameter, reject it if necessary, and in either case state their conclusions.</li></ul>

- When students get a numeric answer, they will be able to use it in a sentence in a way non-specialists (i.e. people who haven't taken a statistics course) can understand.
- Students will think critically about the use of statistics in academic journals and the news.
- Students will use technology to process data.

**Primary modes of assessment:** Instructors of this course on campus exercise some discretion in the percentage of the course grade allotted to particular assignments. In general, however, this course includes the following assessments:

- 3-4 exams (about 40-50%)
- Quizzes (about 15%)
- Homework (20-35%)
- Minitab labs (about 15 to 20%)

**Other notes for instructors:** There are two open access textbooks we recommend for this course: [OpenIntro Statistics](#) and [OpenStax Statistics](#). All campus sections also use Minitab and require TI-83, TI-84, or TI-89 calculators.

Approved by the Department of Mathematical Sciences on 04/06/2026

Signature of department chair or faculty liaison:

*Megan C. Heenchan*