

MAT 201 – Statistical Methods

Catalog Description: (A) Basic concepts of probability, descriptive and inferential statistics including central tendency, variability, correlation, regression, parametric tests. Also listed as COM 230, PSY 201, ECO 221. Fulfills GE1; LASR. Notes: Mathematics majors may take course only as free elective. (3 cr. hr.)

Goals:

To develop

- an understanding of how data can be used to study a population or populations and then to make inferences about that population or those populations
- the ability to gather representative data
- fluency in reading and creating various graphic representations of data
- an understanding of the meaning and the limitations of the usual descriptive statistics of central tendency, variability and correlation
- an understanding of the basic laws of probability
- familiarity with normal distributions and standard z-scores
- the ability to make appropriate inferences about a population based on data gathered in a sample

Required Topics:

- Methods of sampling: simple random, stratified, systematic, cluster, nonrandom
- Measures of central tendency: mean, median, mode, interquartile range
- Measures of position: percentiles
- Measures of variability: max, min, variance, standard deviation
- Graphical display of single-variable data: dot plots, bar graphs, histograms, box and whisker plots
- Graphical display of multi-variable data: scatter plots, bar graphs
- Linear regression and correlation
- Probability: relation to percentages, outcomes, events, sum rule, multiplication rule, independent events, mutually exclusive events
- Discrete random variables and distributions: specified distributions, binomial distribution
- Continuous distributions: basic properties including area under the curve
- Normal distribution and standardized or z-scores
- Sampling distributions: central limit theorem
- Confidence intervals: known and/or unknown standard deviation
- Inferences involving a single population: mean, proportion/binomial probability of success, standard deviation
- Inferences involving two populations: mean, proportion
- Chi-square distribution

Optional Topics:

- Ratio of variances
- ANOVA