

MATH 427 Probability and Mathematical Statistics II 3 credits

The theories of probability and statistics are developed through a systematic study of probability spaces, random variables, discrete and continuous probability distributions, mathematical expectation, moment generating functions, moments of linear combinations of random variables, sampling theory and distributions, theory and applications of estimation and hypothesis testing, regression and correlation and analysis of variance.

Math 426-427 is a two semester sequence that forms a capstone course in the statistics offerings. This is a required sequence for mathematics majors who minor in statistics. The subject matter of these courses is particularly suited to persons who wish to go on to graduate study in statistics or to employment at an entry level statistics position in business, industry or government.

2) Math 427

- (a) Estimation
 1. Maximum likelihood estimators.
 2. Unbiased estimators.
 3. Consistent estimators.
- (b) Confidence intervals and tests.
 1. Pivotal quantities.
 2. Testing statistical hypotheses.
 3. Power.
- (c) Optimal tests.
 1. Most powerful tests.
 2. Likelihood ratio tests.
- (d) Sufficient statistics.
 1. Factorization criteria.
 2. Minimal and complete sufficiency.
- (e) Linear statistical models.
 1. Linear regression.
 2. Analysis of variance.
- (f) Basin statistics.
 1. Confidence intervals.
 2. Hypothesis tests.

Math 427 is a LEVEL III course and is a required course for all mathematical statistics majors. It is an elective course for all applied statistics and mathematic majors.