Statistics 462

Probability and Statistics II (3)

(Effective Spring 2021)

Prerequisite: Math 320 and Stat 461.

Catalog Description: Discrete and continuous probability spaces, statistical independence, distributions, discrete and continuous random variables, expectations, moment generating functions, limiting distributions, estimation of parameters, confidence intervals, hypothesis testing with applications, linear regression and correlation, multiple linear regression.

Learning Outcomes for Major: This course addresses one or more of the student learning outcomes for the major.

Upon completion of his/her degree from the University of Tennessee at Martin with a major in mathematics, the graduate will be able to:

i. apply mathematical concepts and principles to perform numerical and symbolic computations.
ii. use technology appropriately to investigate and solve mathematical and statistical problems.
iii. write clear and precise proofs.
iv. communicate effectively in both written and oral form.
v. demonstrate the ability to read and learn mathematics and/or statistics independently.

Teaching Objectives: The student will:

1. Determine point estimates and confidence intervals for means, difference between means, variances, and proportions and determine required sample sizes to limit sampling errors.
2. Perform basic statistical hypothesis tests with means, variances, proportions and with equality between distributions and goodness of fit.
3. Examine topics in mulitivariate distributions including basic introduction, correlation coefficients, conditional distributions, bivariate normal distribution, correlation analysis, and random variable transformations.
4. Study basic statistical inference theory including sufficient statistics, Bayesian estimation, asymptotic distributions and maximum likelihood estimators, Chebyshevs inequality and probability convergence, best critical regions, likelihood ratio tests.

Text(s): Probability and Statistical Inferences Tenth Edition, Robert V. Hogg, Elliot A. Tanis and Dale L. Zimmerman, Pearson Publishing, 2019. ISBN: 978-0135189399.

Outline:

Chapter	Title (Sections)
6	Point Estimation (1–5, 7–8)
7	Confidene Intervals (1–5)
8	Tests of Statistical Hypotheses (1–6)
9	More Tests (1–4)
	Additional Topics (as time allows)

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