University Of Arkansas – Fort Smith
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General Syllabus

Stat 2603 Probability and Statistics II

Credit Hours: 3   Lecture Hours: 3   Laboratory Hours: 0

Prerequisite: STAT 2503 Probability and Statistics I

Effective Catalog: 2018~2019

I.   Course Information

   A.   Catalog Description
   A continuation of STAT 2503 Probability and Statistics I. Topics including analysis
   of variance, simple Linear regression, multiple regression and model building,
   categorical data analysis, and methods of nonparametric statistics

   B. Additional Description
   Students will utilize graphing calculators and will be introduced to and utilize a
   computer statistical package such as MINITAB or SPSS.

II.   Student Learning Outcomes

   A.   Subject Matter
   Upon successful completion of this course, the student will be able to:

   1. Compare more than two means using completely randomized, randomized block,
       and factorial designs.
   2. Apply the least squares approach to filling a linear model.
   3. Assess the utility of a linear model.
   4. Use a linear model for estimation and prediction.
   5. Evaluate the overall utility of a first-order multiple regression model.
   6. Build non-linear models with both quantitative and qualitative variables.
   7. Compare nested models.
   8. Test categorical probabilities associated with one-way and two-way tables.
   9. Use distribution-free tests for single population inferences, two population
       inferences, and multiple population inferences.
   10. Perform analysis of variance, simple linear regression, multiple regression, chi-
       square analyses, and nonparametric analyses using a statistical package such as
       Minitab.

B. University Learning Outcomes
Probability and Statistics II enhances student abilities in the following areas.

Analytical Skills
Critical Thinking Skills: Students will identify a problem or issue; research, evaluate, and compare information from varying sources in order to evaluate authority, accuracy, and bias relevant to the problems/issues; generate solutions/analysis of problems/issues evaluated; and assess and justify the solutions and/or analysis.

Communication Skills (written and oral)
Students will compose coherent documents which are appropriate for the intended audience and will effectively communicate orally in a public setting, such as presentation for peers or at conferences.

III.   Major Course Topics

A.   Analysis of Variance
1.   One-way ANOVA
2.   F-distribution
3.   Multiple comparisons
B.   Simple Linear Regression
1.   Simple regression models
2.   Estimation and prediction
3.   Inferences in correlation
4.   Residual analysis
C.   Multiple Regression and Model Building
1.   Regression parameters
2.   Predictor variables
3.   Confidence intervals for mean response
4.   Model assumptions
D.   Categorical Data Analysis
1.   Goodness-of-fit test
2.   Test for homogeneity
3.   Test for independence
E.   Nonparametric Statistics
1.   Wilcoxon's Signed-rank
2.   Rank-sum test
3.   Kruskal-Wallace test
F.   The Use of a Computer Statistical Program in the Analysis of Data
1.   Excel
2.   R
3.   SPSS
4.   SAS
5.   Software applicable per instructor to analyze small and large data sets