Technical Data Analysis

Course Description

Course: 2030:345 Technical Data Analysis  
Credits: 2  
Prerequisites: A grade of C- or better in either 2030:154 Technical Mathematics IV or 2030:216 Applied Finite Mathematics. 

Bulletin Description: Prerequisites: A grade of C- or better in either 2030:154 Technical Mathematics IV or 2030:216 Applied Finite Mathematics. Data summarization including graphing presentation, numerical measures, introduction to probability, confidence intervals, and hypothesis testing.

Course Outcomes

After completing this course the student should have the following competencies:

1. an understanding of the nature of data sets;  
2. an understanding of the process of designing of a statistical study;  
3. an understanding of the importance of using different methods of collecting data sets;  
4. the ability to summarize data based on the methods of descriptive statistics: graphing presentation and numerical measures (measures of central tendency, measures of variation, measures of position);  
5. the ability to use the counting techniques (multiplication principle, permutations, combinations);  
6. the ability to compute probabilities, odds, and expected values;  
7. an understanding of the normal distribution and its applications;  
8. the ability to compute confidence intervals;  
9. the ability to do hypothesis testing;  
10. the ability to apply all of the above to real-life projects;  
11. the ability to use technology such as the graphing calculator and spreadsheet software.

Course Outline

1. Introduction to statistics  
   (a) The nature of data  
   (b) Uses and abuses of statistics  
   (c) Design of experiments  
2. Describing, exploring, and comparing data  
   (a) Summarizing data with frequency tables
(b) Pictures of data  
(c) Measures of central tendency  
(d) Measures of variation  
(e) Measures of position  
(f) Exploratory data analysis  

3. Correlation and regression  
   (a) Linear regression  
   (b) Correlation  

4. Probability  
   (a) Counting  
   (b) Fundamentals  

5. Probability distributions  
   (a) Random variables  
   (b) Binomial probability distributions  
   (c) The normal distribution  
   (d) The central limit theorem  
   (e) Approximating a binomial distribution  
   (f) Determining normality  

6. Estimates and sample sizes  
   (a) Estimating population means  
   (b) Determining sample size  
   (c) Estimating population proportions  

7. Hypothesis testing  

Textbook  


Calculator Policy  

All students are **required** to have a **graphing** calculator with minimum functionality equivalent to that of the **Texas Instruments TI–83** calculator. Every student is **required** to have possession of their calculator by the end of the first week of classes. No exceptions to this policy will be made by the instructor.