

Technical Data Analysis

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1 Course Description

Course: 2030:345 Technical Data Analysis

Credits: 2

Prerequisites: 2030:154 or equivalent with a grade of C– or better, or placement test.

Bulletin Description: Prerequisites: 2030:154 or equivalent with a grade of C– or better, or placement test. Data summarization including graphing presentation, numerical measures, introduction to probability, confidence intervals, and hypothesis testing.

2 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.

3 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

4 Textbook

Elementary Statistics. Mario F. Triola. Pearson.

5 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.