

J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: MTH 246 Credits: 3

Course Title: Statistics II

Course Description

Continues the study of estimation and hypothesis testing with emphasis on advanced regression topics, experimental design, analysis of variance, chi-square tests, and non-parametric methods. Lecture 3 hours. Total 3 hours per week. 3 credits.

General Course Purpose

To serve as a second course in statistics that focuses on multivariate and nonparametric techniques useful to business, science, and social science majors.

Course Prerequisites/Corequisites

Prerequisite: Completion of MTH 245 or equivalent with a grade of C or better.

Course Objectives

Upon completing the course, the student will be able to:

Review of Hypothesis Testing

- ” Conduct hypothesis tests for population means and proportions.
- ” Conduct a hypothesis test for the equality of two population means where:
 - o the samples are independent and the population variances are assumed unequal.
 - o the data consists of matched pairs.
- ” Conduct a hypothesis test for the presence of correlation.

Experimental Design

- ” Define and apply the basic principles of design, including randomization, replication, and treatment/control groups.
- ” Explain single and double blinding.
- ”

- ” Conduct chi-squared tests for:
 - o goodness of fit.
 - o independence between rows and columns of a two-way contingency table.
 - o homogeneity of population proportions.

Analysis of Variance (ANOVA)

- ” Conduct one-way ANOVA to test the equality of two or more population means for both equal and unequal sample sizes and recognize its relationship to the pooled two sample t-test.
- ” Conduct a multiple comparison test, such as Tukey’s HSD, to determine which of the three or more population means differs from the others.
- ” Conduct two-way ANOVA on sample data categorized with two fixed factors.

Technology Application

- ” Construct statistical tables, charts, and graphs using appropriate technology.
- ” Perform statistical calculations using an appropriate statistical software package.
- ” Complete statistical project. Students are required to complete some form of semester project in their course that is worth a significant portion of the student’s grade. This could be either an individual or group effort, and could be completed in stages through the semester or as a single, stand-alone exercise. As a minimum, the