Tennessee Technological University
Mathematics Department

MATH 3080: Statistical Methods II

I. COURSE DESCRIPTION FROM CATALOG: Introduction to parametric statistical methods with some non-parametric alternatives, sampling, probability, Type I and Type II Error, sample size estimation, confidence interval estimation, and test hypotheses using normal, Student's t, Snedecor's F, Chi-Square, and the binomial distributions, linear regression, analysis of variance, and data analysis utilizing statistical software. Lec. 3-3. Cr. 3-3.

II. PREREQUISITE(S): C or better in MATH 3070

III. COURSE OBJECTIVE(S): Ability to apply basic statistical methodology for data analysis that is applicable in a variety of scientific disciplines. Ability to use computer programs to summarize and present data for statistical analysis

IV. TOPICS TO BE COVERED:
There may be some overlap with Math 3070. Start where the previous course ended.

Chapter 7 Inferences about Population Variances

Section 7.1 Introduction and Case Study
7.2 Estimation and Test for a Population Variance
7.3 Estimation and Test for Comparing Two Population Variances
7.4 Tests for Comparing t > 2 Population Variances

Chapter 8 Inferences about More than Two Population Central Values Section

Section 8.1 Introduction and Case Study
8.2 A Statistical Test about More than Two Population Means: An Analysis of Variance
8.3 The Model for Observations in a Completely Randomized Design
8.4 Checking on the AOV Conditions
8.5 An Alternative Analysis: Transformations of the Data
8.6 A Nonparametric Alternative: The Kruskal-Wallis Test

Chapter 9 Multiple comparisons

Section 9.1 Introduction and Case Study
9.2 Linear Contrasts
9.3 Which ElTor Rate is Controlled?
9.4 Fisher's Least Significance Difference
9.5 Tukey's W Procedure
9.6 Student-Newman-Keuls Procedure
9.7 Dunnett's Procedure: Comparison of Treatments to a Control
9.8 Scheffe's S Method

Chapter 10 Categorical Data

Section 10.1 Introduction and Case Study
10.2 Inferences about a Population Proportion π
10.3 Inferences about the Difference between Two Population Proportions
10.4 Inferences about Several Proportions: Chi-Square Goodness-of-Fit Test
10.5 The Poisson Distribution

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119.

10.6 Contingency Tables: Tests of Independence and Homogeneity
10.7 Measuring Strength of Relation
10.8 Odds and Odds Ratio

Chapter 11 Linear Regression and Correlation
Section 11.1 Introduction and Case Study
11.2 Estimating Model Parameters
11.3 Inferences about Regression Parameters
11.4 Predicting New y Values Using Regression
11.5 Examining Lack of Fit in Linear Regression
11.6 The Inverse Regression Problem (Calibration)
11.7 Correlation

Chapter 14 Design Concepts for Experiments and Studies
Section 14.1 Introduction
14.2 Types of Studies
14.3 Designed Experiments Terminology
14.4 Controlling Experimental Error
14.5 Randomization of Treatments to Experimental Units
14.6 Determining the Number of Replications (As Time Permits)

Chapter 15 Analysis of Variance for Standard Designs
Section 15.1 Introduction and Case Study
15.2 Completely Randomized Design with Single Factor
15.3 Randomized Complete Block Design
15.4 Latin Square Design
15.5 Factorial Treatment Structure in a Completely Randomized Design
15.6 Factorial Treatment Structure in a Randomized Complete Block Design
15.7 Estimation of Treatment Differences and Comparisons of Treatment Means

V. ADDITIONAL INFORMATION:

VI. POSSIBLE TEXTS AND REFERENCES:

An Introduction to Statistical Methods and Data Analysis, 5th edition, Lyman Ott and Michael Longnecker

VII. ANY TECHNOLOGY THAT MAY BE USED: