GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF ARTS, COMMERCE & EDUCATION

MANAGEMENT SCIENCE 3120

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Text:

Paul Newbold, *Statistics for Business & Economics, Fourth Edition*, Prentice Hall, 1995
(any statistic text book for business and / or Economics would be good)

Labs:

There is a strong emphasis on the microcomputer and the statistical software, ***SPSS for windows***. This software is available in lab. Students are expected to become familiar with statistical analyses using SPSS . To integrate the computer use into the course, a term-paper is planned (date collection, data entry, model building, statistical calculation & output, output interpretation).

Prerequisite: EC1010 / 1020, Math 1130 or 1140 (Calculus) and MS 3010.

Grading: The exams have weights of 20 each and term paper has a weight of 20.

Course Outline: **Text Reading**

Review : CH. 7, 8, & 9.

Point Estimate: CH. 7
- Unbiased Estimators & Their Efficiency
- Choice of Point Estimator

Estimating with Confidence Intervals: CH. 8
- The Principle & The Interpretation of a Confidence Intervals
- The Probability of Error - The Alpha Value
- Confidence Intervals for the Population Mean; Large & Small sample
- Confidence Intervals for Population Proportions
- Controlling the Interval Width
- Determining the Sample Size
- Properties of Good Estimators;
  - Unbiased, Efficient, Consistent, & Sufficient Estimator

Hypothesis Testing : CH. 9
- The Principle of Hypothesis Testing

Determination of Decision Rule
Two-Tailed & One-Tailed Tests
A Two-Tailed Hypothesis Test for population Mean; Large & Small Sample
One-Tailed Tests for Population Mean; Large & Small Sample
An Alternative Method of Hypothesis Testing; p - Value
Type I & Type II error

EXAM # 1

Tests of variance & Analysis of Variance CH. 15
Testing variance of a Normal Distribution; Chi-Square (Ch. 9 section 9.4 PP 344-347)
Comparing the variance of two Normal Populations
One-way ANOVA; The Completely Randomized design
Two-Way ANOVA

Some Nonparametric Tests CH. 10

Simple Regression & Correlation CH. 12
Introduction
The mechanics of straight Line
The Basic Objective of Regression Analysis
Ordinary Least Square (OLS); the line of best fit
An Example of Using OLS
Assumptions of OLS
A Measure of Goodness-of-Fit; The Standard Error of Estimate
Correlation Analysis
Limitations of Regression Analysis
Interval Estimation in Regression Analysis
Hypothesis testing about the Population correlation Coefficient
Test inferences about the Population Correlation Coefficient
Analysis of Variance Revisited

EXAM # 2

Multiple Linear Regression CH. 13
The Multiple Regression Model
Least Square Estimation
Standard Assumptions for Multiple Regression Model
The Gauss-Markov Theorem
The Explanatory Power of a Multiple Regression Equation
Confidence Intervals & Hypothesis Tests for Individual Regression Parameters
Test on Sets of Regression Parameters
Prediction

EXAM # 3

More on Regression — CH. 14

- Model Building Methodology;
  - Model Specification, Coefficient Estimation, Verification, Interpretation & Inference
- Dummy Variables
- Lagged Dependent Variables
- Nonlinear Models
- Specification Bias
- Multicollinearity
- Heteroscedasticity
- Autocorrelated Errors; Durbin-watson Statistic

Inference Using Two Populations — CH. 9

- Estimating the Difference between Two-Population Means
- Confidence Intervals for the Difference between Two Proportions
- Selecting the Proper Sample Size
- Hypothesis testing Involving Two Population Large & Small Samples
- A Test for the Difference between Two Proportions

Review

EXAM # 4

Homework:

Problems from the text will be recommended. The list of problems is the minimum the students should do in each section. you will need to do these to find out your understanding of the material.