



Grande Prairie Regional College

School of Business

Department: Business Administration and Commerce

COURSE OUTLINE – FALL 2007

BA 2060 3 (3-0-2) UT

Introduction to Statistics for Business

Instructor	Sukhvir Sandhu	Phone	539 - 2234 (office) 539 - 9787 (Home)
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Office Hours	10:00 – 11:00 am M, W or 9:00 -10:00 am T, R or by appointment		

Prerequisite(s):

BA 1050 or consent of the instructor

Required Text/Resource Materials:

A Course in Business Statistics, 4th edition, by Groebner, Shannon, Fry, and Smith.

THE TEXT WILL BE USED EXTENSIVELY. Students are encouraged to do as many problems as possible.

A calculator with Stats functions, preferably the Sharp EL-733A. Students using alternate calculator are responsible using the functions. A calculator should be brought to all classes and labs.

A microcomputer and a Microsoft Excel will be used to assist with the statistical calculations for the lab. The project will require the use of Excel. Students should bring to the lab the CD disk supplied with the book.

Description

This is an introduction to the use of random variables, descriptive statistics, probability, the binomial and normal probability distributions, estimation, small and large sample theory, analysis of variance, tests of hypotheses, regression analysis, forecasting and time series. Practical applications are emphasized in the course.

Credit /Contact Hours:

This is a 3 credit course with 4 hours lecture per week and an hour lab component with a strong emphasis on statistical applications. Total 75 hours are assigned for this course. Students are expected to attend all classes.

Delivery Modes:

For each topic listed, there will be a classroom lecture/ discussion and a demonstration of related statistical procedures. Lectures will be accompanied by the related transparencies as well as a good use of a white board. I will assign relevant textbook readings and problems and review key topic-points regularly. Assignments and class tests will be scheduled to test your knowledge, understanding, and application of the material.

Attendance:

Regular classroom attendance is expected. Please do not be late. You should **study** each assigned reading both before and after it is discussed in class; apply your understanding by class participation and solving the required problems; ask questions in the class; come and see me during my office hours or make an appointment to clear up any misunderstandings or uncertainties about material covered in the class; and demonstrate your mastery of the subject matter whenever you get the chance – tests, assignments, and class participation.

For strong understanding of the concepts in this course requires a great commitment of time and team-work. Plan your schedule accordingly. Do not fall behind in the assigned readings and problems because it is difficult to catch up.

Transferability:

Athabasca University; Canadian University College; King's University College*; Augustana University College.

An **asterisk*** beside any transfer institution indicates important transfer information. Consult Alberta Transfer Guide.

Objectives:

The student will develop problem-solving skills and gain appreciation of the statistics of modern society. It prepares the student to apply statistical analysis skills to real world decision-making problems.

Chapter 1: Where, Why, and How of Data Collection

- Know the key data collection methods.
- Know the difference between a population and a sample.
- Understand how to categorize data by type and level of measurement.
- Understand the similarities and differences between different sampling methods.

Chapter 2: Graphs, Charts, and Tables – Describing your data

- Be able to construct frequency distributions both manually and with your computer.
- Be able to construct and interpret a frequency histogram.
- Know how to construct and interpret various types of bar charts.
- Be able to build a stem and leaf diagram.
- Be able to create a line chart and interpret the trend in the data.
- Be able to construct a scatter plot and interpret it.
- Be able to develop and interpret joint frequency tables.

Chapter 3: Describing Data Using Numerical Measures

- Compute the mean, weighted average, median, and mode for a set of data and understand what these values represent.
- Compute the range, variance, and standard deviation and know what these values mean.
- Know how to construct a box and whisker graph and be able to interpret it.

- Compute the coefficient of variations and z-scores and understand how they are applied in decision-making situations.
- Use numerical measures along with graphs, charts, and tables to effectively describe data.

Chapter 4: Using Probability and Probability Distributions

- Understand the three approaches to assessing probabilities.
- Be able to apply the common rules of probability.
- Be able to distinguish the difference between discrete and continuous probability distributions.
- Be able to compute the expected value and standard deviation for a discrete probability distribution.

Chapter 5: Discrete and Continuous Probability Distributions

- Be able to apply the binomial distribution to business decision-making situations.
- Be able to compute probabilities for the Poisson and hyper-geometric distribution.
- Be able to discuss the important properties of the normal probability distribution.
- Recognize when the normal distribution might apply in a decision-making process.
- Be able to calculate probabilities using the normal distribution table and be able to apply the normal distribution appropriate business situations.
- Recognize situations in which the uniform and exponential distributions apply.

Chapter 6: Introduction to Sampling Distributions

- Understand the concept of sampling error.
- Determine the mean and standard deviation for the sampling distribution of *sample mean*.
- Determine the mean and standard deviation for sampling distribution of the *sample proportion*.
- Understand the importance of the Central Limit Theorem.
- Apply sampling distributions for *sample mean and sample proportion*.

Chapter 7: Estimating Population Values

- Distinguish between a point estimate and a confidence interval estimate.
- Construct and interpret a confidence interval estimate for a single population mean using both the standard normal and t-distributions.

- Determine the required sample size for estimating a single *population mean*.
- Establish and interpret a confidence interval estimate for a single *population proportion*.

Chapter 8: Introduction to Hypothesis Testing

- Formulate null and alternative hypotheses for applications involving a single population mean or proportion.
- Correctly formulate a decision rule for testing null hypotheses.
- Know how to use the test statistics, critical value, and p-value approaches to test the null hypothesis.
- Know what Type I and Type II errors are.
- Compute the probability of a Type II error.

Chapter 9: Estimation and Hypothesis Testing for Two Population Parameters

- Discuss the logic behind, and demonstrate the techniques for, using sample data to test hypotheses and develop interval estimates about the difference between two population means for both independent and paired samples.
- Carry out hypothesis tests and establish interval estimates, using sample data, for the difference between two population proportions.

Chapter 10: Hypothesis Tests for One and Two Population Variances

- Formulate and carry out hypothesis tests for a single population variance.
- Formulate and carry out hypothesis tests for the difference between two population variances.

Chapter 11: Analysis of Variance

- Recognize situations that call for the use of analysis of variance.
- Understand the basic logic of analysis of variance
- Be aware of several different analysis of variance designs and understand when to use each.
- Perform a single factor hypothesis test using analysis of variance manually and with the aid of Excel
- Conduct and interpret post-analysis of variance pair-wise comparison procedures.
- Recognize when randomized block analysis of variance is useful and be able to perform randomized block analysis.

Chapter 12: Introduction to Linear Regression and Correlation Analysis

- Calculate and interpret the simple correlation between two variables.
- Determine whether the correlation is significant.
- Calculate the simple linear regression equation for a set of data and know the basic assumptions behind regression analysis.
- Determine whether a regression model is significant.
- Calculate and interpret confidence intervals for the regression coefficient.
- Recognize regression analysis applications for purposes of prediction and description.
- Recognize some potential problems if regression analysis is used incorrectly.
- Recognize several non-linear relationships between two variables and be able to introduce the appropriate transformation to apply linear regression analysis.

Chapter 13: Multiple Regression Analysis and Model Building

- Understand the general concepts behind model building using multiple regression analysis.
- Use variable transformations to model non-linear relationships in a regression model.
- Apply multiple regression analysis to business decision-making situations.
- Analyze the computer output for a multiple regression model and interpret the regression results.
- Test hypothesis about the significance of a multiple regression model and test the significance of the independent variables in the model.
- Recognize potential problems when using multiple regression analysis and take steps to correct problems.
- Incorporate qualitative variables into a regression model by using dummy variables.

Grading Criteria:

Numerical Assignments and Quizzes	20%
Computer Assignments	10%
Final Project	10% (Chapter 12 & 13)
First Test (Chapter 1-3)	15%
Second Test (Chapter 4-6)	15%
Final Exam (Chapter 7 -13)	30%

Note: No repeat final exam. Refer to page 41 in the College Calendar.

Assignment, Quiz, Test and Exam Policies:

1. Assignments will be handed in at the beginning of class on the due date.
2. Quizzes, tests, and exams will be written as scheduled.
3. Surprise quizzes occur on Friday.
4. Final examinations will be scheduled by the Registrar during the period of the 2nd or 3rd week of December, 2007. **Do not plan any activities during this period.**
5. **First Test** and **Second Test** are tentatively scheduled for **last week** September and **3rd week of** October.
6. Each student will be required to make and bring their own formula sheet for the exams.
7. Students will also be required to read/complete various additional handouts and exercises throughout the term.

Grades will be assigned on the Letter Grading System.

Department of Business and Commerce
Grading Conversion Chart

Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A⁺	4	90 – 100	EXCELLENT
A	4	85 – 89	
A⁻	3.7	80 – 84	FIRST CLASS STANDING
B⁺	3.3	76 – 79	
B	3	73 – 75	GOOD
B⁻	2.7	70 – 72	
C⁺	2.3	67 – 69	SATISFACTORY
C	2	64 – 66	
C⁻	1.7	60 – 63	
D⁺	1.3	55 – 59	MINIMAL PASS
D	1	50 – 54	
F	0	0 – 49	FAIL

Unit Descriptions with Corresponding Textbook Lessons and Timelines

Chapter no.	Topic	Working days.	Work to be Handed In
1	The Where, Why and How of Data Collection	2	
2	Graphs, Charts, and Tables – Describing Your Data	3	Chapter 1 & 2
3	Describing Data Using Numerical Measures.	3	Chapter 3
4	Using Probability and Probability Distribution	1	
Sept 28			Test #1 (1-3)
4	Using Probability and Probability Distribution Discrete and Continuous Probability Distribution	2	Chapter 4
5	Discrete and Continuous Probability Distribution Introduction to Sampling Distribution	3	Chapter 5
6	Introduction to Sampling Distribution	1	
7 Oct. 19	Estimating Population Values	2 Test #2	Test #2 (4-6)
8	Introduction to Hypothesis Testing	3	Chapter 8
9	Estimation and Hypothesis Testing for Two Population Parameters.	3	Nov. 2 is the last day to withdraw from the course.
10	Hypothesis Tests for One and Two Population Variances	3	Chapter 10
11	Analysis of Variance	3	Computer Assignment
12	Introduction to Linear Regression and Correlation Analysis	4	
13	Multiple Regression Analysis and Model Building	4	Chapter 12 & 13
Dec. 7	Computer Assignment		
	Final Exam 7-13		

