MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN

SULEYMAN DEMIREL UNIVERSITY

FACULTY OF ECNOMICS

"CONFIRM"
Vice-rector on Academic Affairs

_____Mr. Halit Yilmaz
"____"_____ 2010

Educational Program: Master of Business Administration and Master of Arts
Specialty: 6M0507 and 6M0506
Form of education: evenings

SYLLABUS

On the course **STATISTICAL METHODS**

Year: 1
Semester: 2
Number of credits: 3 (lectures - 2 hours, practical – 1 hour)
Instructor: Dr. Kenneth R. Szulczyk
Tel.: 229-7190
Office: #B126

ALMATY
2010

Completed by: Instructor Dr. Szulczyk

The syllabus has been developed on the basis of the Typical and Working Programs of the course for students of Specialty 6M0507 and 6M0506

Agreed at the meeting of the Faculty of “Economics”

Minutes № __ of _____ 200____ .

Head of the Department _____ Dr. Mesut Yilmaz.

Approved by the Educational Methodical Committee of the Undergraduate Department
Minutes № __ of _____ 200____ .

Dean of the Faculty _____ Dr. Mesut Yilmaz.

Course: Statistical Methods
Code: ECO 631
Number of credits: 3

Instructor's name	**Time and location**		**Contact**
	Lectures	Practical	
Dr. Kenneth R. Szulczyk	Tuesday 6:00 -8:00	Wednesday 6:00-7:00	Tel: 229-7190 Cell: 8 7027238077

I. COURSE DESCRIPTION

This course is a quantitative course that gives students an overview of basic statistics. Students learn the common probability distributions such as the Gaussian normal, t, F, chi square, binominal, and Poisson. Furthermore, students learn the difference between a sample and population, and test whether population means are the same. Students also learn to construct contingency tables and test various hypotheses associated with them. Towards the end of the course, students will learn linear regression and how it relates to correlation.

II .COURSE OBJECTIVES:

Upon successful completion of this course students will be able to:

1. Calculate basic statistics, such as the mean, mode, median, variance, standard deviation.
2. Understand and know how to plot data and design a histogram.
3. Describe the difference between a sample and population.
4. Calculate confidence intervals for data and for sample means.
5. Know which probability distribution to use for which statistical test. The probability distributions used in this course are the Gaussian normal, t, F, chi-square, binominal, and Poisson.
6. Describe a hypothesis test and how Type I, Type II, and a test's power come into play.
7. Calculate the z and t tests for testing the equality of two sample means. These tests hinge on whether the population variances are known or unknown.

8. Understand how to build a contingency table and test hypotheses by using a chi-square test or Yate's correction.
9. Calculate the Fisher's exact probability tests for simple contingency tables.
10. Describe and explain linear regression and its relationship to correlation. Further, students will understand how to perform hypothesis tests on individual parameter estimates and calculate confidence intervals.
11. Decompose variances from a regression in an Analysis of Variance table and use the F-test to test a linear regression model,

III. LEARNING OBJECTIVES:
Students will learn the following topics:

1. Data description and plots.
2. Manually calculate basic statistics, such as the mean, mode, median, variance, and standard deviation.
3. Population versus samples.
4. Various distributions, such as the normal, t, chi-square, Poisson, and binominal.
5. Confidence intervals for data and means.
6. Type I and Type II errors and a statistical test's power.
7. The z and t tests for testing the differences between two sample means.
8. Contingency tables, chi-square tests, and Yate's correction.
9. Fisher's exact probability test for a contingency table.
10. Pearson's and Spearman's correlation.
11. Linear regression and the R^2.
12. Analysis of variance and the F-distribution.

IV. PRE-REQUISITS
None

V.TEXTBOOKS
Required Text:

The textbook is an ebook and available from BMJ. The instructor will send pdf files of the textbook

1. Swinscow, T. 1997. *Statistics at Square One*. Available at www.bmj.com/statsbk/

Required Reading: Students are encouraged to surf the Internet for information relevant to classroom topics of discussion. These sites are particularly helpful:

1. http://statpages.org/javasta3.html
2. http://www.oswego.edu/~economic/newbooks.htm
3. www.wikipedia.org

VI. PROCEDURES AND REQUIREMENTS:

1. **Class Participation** -- Students should come to class well prepared, having read the assigned material. They are encouraged to ask questions, make comments, and participate in class discussions. Students who are late or absent are not properly participating in our class, regardless of how involved they may be when present.

2. **Attendance and Dishonesty** -- Students are required to attend classes on a regular basis. University policy will be followed when students miss their class appointments, or engage in any form of academic dishonesty. In both cases, students may be awarded a failing grade for their actions.

3. **Homework** -- Students are required to complete their homework on time. All homework requires Microsoft Excel. The homework complements the techniques the students learn from class and applies these techniques to analyze data and perform statistical tests.

4. **Examinations** – There will be <u>two</u> midterm exams and <u>one</u> final exam during the semester. The tests will consist of a mix of theory and application questions. Sample exams are available on the instructor's website at: www.ken-szulczyk.com

5. **Late assignments** -- Late assignments will not be accepted. A zero will be recorded when cases, assignments, presentations, projects, or examinations are not completed at the regularly scheduled time.

VII EVALUATION

The course grade will be based upon the following criteria:

Assignment type	Week	Marks
Participation: [Participation = Attendance + Questions + Comments + Suggestions + etc.] **Home work/ Quizzes etc…**	**1-7**	**15 %**
Mid Term 1	**7th week**	**15%**
Participation: [Participation = Attendance + Questions + Comments + Suggestions + etc.] **Home work/ Quizzes etc…**	**8-14**	**15%**
Mid term 2	**14th week**	**15%**
Final	**16th week**	**40%**
TOTAL		**100%**

Note: Students who fail to submit the course work on time will receive 'F' grade in the ECO course.

VIII COURSE SCHEDULE AND READING ASSIGNMENTS:

The course schedule and assignments are listed below. This is your road map to the course, so please read it carefully.

Week	Topics of Lectures (3 hours per week)	Self Study (3 hour per week)	Form of Control	Text: Swinscow
1	Data display and summary	Exercise 1.1		Read Chapter 1
2	Mean and standard deviation	Exercises 2.1 and 2.2		Read Chapter 2
3	Populations and samples	Exercise 3.1	Homework #1	Read Chapter 3
4	Statements of probability and confidence intervals	Exercises 4.1 and 4.2	Homework #2	Read Chapter 4
5	Differences between means: type I and type II errors and power	Exercise 5.1	Homework #3	Read Chapter 5
6	Differences between percentages and paired alternatives	Exercises 6.1 and 6.2	Homework #4	Read Chapter 6
7	Midterm Examination I		15 points	
8	The t tests	Exercises 7.3 and 7.4	Homework #5	Read Chapter 7
9	The chi-squared tests	Exercises 8.1 and 8.2	Homework #6	Read Chapter 8
10	Fisher's exact probability test	Exercise 9.1		Read Chapter 9
11	Rank score tests	Exercise 10.2	Homework #7	Read Chapter 10
12	Correlation and regression	Exercise 11.1	Homework #8	Read Chapter 11
13	Survival analysis	Exercise 12.1		Read Chapter 12
14	Study design and choosing a statistical test	Exercises 13.1 and 13.2		Read Chapter 13

15	Midterm Examination II			15 Points	
	Final Examination			40 Points	
Total				**100 points**	

IX. References:

1. Fernandes, Marcelo. 2009. Statistics for Business and Economics. Marcelo Fernandes & Ventus Publishing ApS.
2. Gujarati, Damodar. 1992. Essentials of Econometrics. McGraw-Hill International.
3. Greene, William H. 2003. Econometric Analysis. Prentice Hall, 5th edition.