Eco 204 - Statistics for Business and Economics II

East West University

Summer 2022

Instructor: Sk. Tanvir Hossain		**Time:**	Mon & Wed - 1:30 - 3:00 PM
Email: tanvir.hossain@ewubd.edu		**Room:**	AB 3 - 301 (Section 5)

Office Hours: Wednesday - 10.30 - 12.30. If you cannot come in this time, then please send me an email with your queries, maybe we need to fix other time.

Description of the Course: Continuation of ECO104. This course introduces point and interval estimation, hypothesis testing, statistical inferences, goodness of fit and related concepts required for conducting regression analysis. Students will be introduced to basic linear and multiple regressions, their applications in Microsoft Excel and how to interpret regression results. A practical project is assigned to extend student skills set in linear regression and time series techniques.

Books: The primary reference will be Anderson, Sweeney, Williams, Camm, Cochran, Fry and Ohlmann (2020) and the chapter references in this outline are taken from there. Additional reference is Newbold, Carlson and Thorne (2020)

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Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., Cochran, J. J., Fry, M. J. and Ohlmann, J. W. (2020), *Statistics for Business and Economics*, 14th edn, Cengage, Boston, MA.

Newbold, P., Carlson, W. L. and Thorne, B. M. (2020), *Statistics for Business and Economics*, 9th edn, Pearson, Harlow, England.

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Here is the list of topics in detail -

- **Interval Estimation and Testing (one-sample):** Confidence Intervals for Mean (variance known and unknown) and Confidence Intervals for Population Proportions one sample, Developing Null and Alternative hypothesis, Type-I and Type II errors, Hypothesis tests for Population Mean (variance known and unknown), Hypothesis testing for Population Proportions (Ch- 8.1, 8.2, 8.4, 9.1, 9.2, 9.3, 9.4, 9.5)
- **Interval Estimation and Testing (two-sample):** Confidence Intervals and Hypothesis testing for the difference between two Population Means (Variance known and unknown), Confidence Intervals and Hypothesis testing for the difference between two Population proportions , Hypothesis Testing for the difference between two Population Means (Matched Samples), Confidence Intervals and Hypothesis Testing for the difference between two Population Proportions (Ch - 10.1, 10.2, 10.3, 10.4)
- **Comparing Multiple Proportions, Test of Independence and Goodness of Fit:** Testing equality of Population Proportions for three or more Populations, Test of Independence, Goodness of Fit Test (Ch - 12.1, 12.2, 12.3)
- **Regression:** Simple Linear Regression Model (Estimation and Testing). Multiple Linear Regression models (Estimation and Testing), Some Model Building approaches (Ch-14, 15.1-15.7 and 16.1, 16.2, 16.6).
- **Time Series Models:** Some time series analysis (Ch - 17.1, 17.2, 17.3, 17.4)
- **Experimental Design and ANOVA:** Experimental Design intro, ANOVA for completely randomized design, Multiple Comparison procedures, Randomized block design, Factorial Experiment (Ch - 13)

- **Non-parametric Testing:** Goodness-of-Fit Tests (Population Parameters Unknown), Nonparametric Tests for Independent Random Samples.

Learning Outcomes:

LO	ECO204	Assessment method									
KUA	Students will be able to	ASSIGNMENT (KUA)	HOMEWORK (KUA)	CLASS PARTICIPATION (KUA)	QUIZ (KUA)	FIELD VISITS	PRESENTATION	GROUP WORK	EXAMINATION (KUA)	PROJECT	REMARKS ("OK" means you have used at least 1 assessment method to test the outcome)
KU	CLO1-Understand the basic concepts of statistical inference;	1	1	1	1				1		OK
KUA	CLO2-analyze and interpret time series data, identify and forecast the trend, seasonal, cyclical variation;	1	1	1	1				1		OK
KUA	CLO3-develop and test statistical hypothesis and its application in business and economics	1	1	1	1				1		OK
KUA	CLO4-Learn to draw sample from a population using probability sampling methods and sampling distribution, construction of sampling	1	1	1	1				1		OK
KUA	CLO5-Develop confidence intervals for a range of population parameters and interpret these intervals;	1	1	1	1				1		OK
KUA	CLO6-Learn Analysis of Variance (ANOVA) (one-way and two-way) to compare among multiple means and variances;	1	1	1	1				1		OK
KUA	CLO7-Briefly explain simple and multiple regression in the field of business and economics and its interpretation;	1	1	1	1				1		OK
KUA	CLO8-Explain the concepts of Non-parametric test and characteristics of Chi-square test, Wilcoxon rank-sum test, Kruskal-Wallis test;	1	1	1	1				1		OK

Grading:

Distribution:

Problem Sets	15%
Quizzes	10%
Lab Assignment	10%
Midterm - 1	20%
Midterm - 2	20%
Final	25%

Usually there will be one problem set in every week, and it has to be turned in with your attempted solutions by the next week. More details will be given later. There will be three quizzes (please check the dates below), I will pick the best two. And lastly there will be a Lab Assignment work. We will talk about the details of this later in the class.

Grading Scheme:

Numerical Scores (%)	Letter Grade	Numerical Scores (%)	Letter Grade
97 & above	A+	73-below 77	C+
90-below 97	A	70-below 73	C
87-below 90	A-	67-below 70	C-
83-below 87	B+	63-below 67	D+
80-below 83	B	60-below 63	D
77-below 80	B-	Below 60	F

Important Dates:

Quiz #1	June, 20 (Mon)
Midterm #1	July, 6 (Wed)
Quiz #2	July, 25 (Mon)
Midterm #2	August, 10 (Wed)
Quiz #3	August, 22 (Mon)
Final Exam	September, 14 (Tue)

Note that, July 11, July 13 and August 15 are holidays, so we do not have classes on these days.

Class Policy:

- Regular attendance is essential and expected.
- Please maintain strict punctuality, you won't be allowed to enter the classroom if you are ≥ 10 minutes late.
- Moreover, if your attendance $< 75\%$, you won't be allowed to take the final.

Academic Honesty: You are expected to maintain Academic Honesty. "Academic Honesty" means - you should perform all academic activities without any form cheating, lying, stealing, plagiarism, receiving unauthorized assistance or using any source of information that is prohibited to use.