DEPARTMENT OF ECONOMICS AND SOCIAL SCIENCES

[Statistics for Business and Economics]

[Statistics is the Grammar of Science – Karl Pearson].

[Summer, 2025]

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Office: 5E21
Office Hours: 12:00 pm to 1:30 pm (Monday & Wednesday) or by appointment
Classes Meet: 12:30 pm to 1:50 pm (Section 1; Sunday & Tuesday)
Class Room: 08B-08C

I. Rationale:

This course consists of the basic concepts of advanced statistics (Inferential Statistics and Decision Theory) and is designed for those students who are enrolled into Bachelor of Social Science (BSS) in Economics and Bachelor of Business Administration (BBA) Program of BRAC University. This is a prerequisite of Econometrics which is a core course for econ major students and this course is also helpful to higher level finance courses.

II. Course Aims and Outcomes:

The purpose of the course is to teach the basics and preliminaries of advance statistics applied to business and other activities in daily life. This course also helps to the students to made intelligent decisions under uncertain conditions.

Specific Learning Outcomes:

CO 1	**Understand** the basic concepts, theories and tools of statistics used in economic and business analysis
CO 2	**Acquire** quantitative skills of statistical analysis used in economic and business decision making
CO 3	**Develop** a perception of the ways that statistical indicators are interpreted
CO 4	**Develop** strong command on inferential statistics and statistical decision making
CO 5	**Develop** critical thinking with statistical skills for economic and business decision making/analysis

III. Format and Procedures:

There will be three quizzes among which best two will be considered. Similarly, two assignments will be taken and best one will be considered. Apart from these students will face one midterm and the final exam during the semester.

IV. Our Stance

The course is split into 24 lectures, each of which should take one hour twenty minutes sessions to cover. The topics follow the structure of the textbook. For each topic, the power points will follow the book quite closely, although in places they will deviate from the text where I feel additional/alternative explanations are helpful.

BRAC University policy regarding minimum required attendance to sit for exams applies. If you skip lectures you will miss out on the full power points and all the explanations that go with them, you will miss out on the answers to in-class exercises, and you will either have to work very hard to make up for it, or you will risk failing the exam. Use of mobile phones, pagers, iPods and any device that may disrupt the class must be turned off during lectures.

The theory for each topic, along with proper applications in economics will be discussed in the lecture classes. After finishing a chapter, you should go through the problems presented at the end of the chapter in the text. These problems will prepare you for the in-class quizzes and exams. In-class multiple choice exercises and quizzes are a good guide to the types of questions you might face. You will receive written feedback on your midterm exam, assignments, and on quizzes within 3 days of the exams. Make sure you read the comments and not just the mark!

V. Course Requirements: We will use basic statistical tools that you have learned in STA 101 BUT we will not have any time to go through the basics.

**Class attendance and participation policy:*

5% marks are allotted for class attendance and participation. Students with less than 70% attendance will not be allowed to appear in the final exam.

****Course readings:**

(a) CLASS NOTES

(b) Newbold, Paul, William L. Carlson, and Betty M. Thorne. Statistics for Business and Economics. 8th ed. New Jersey: Prentice Hall, 2013.

(c) Bekes, Gabor and Kezdi, Gabor. Data Analysis for Business, Economics and Policy. Cambridge University Press, 2021

VI. Academic Integrity

Each student in this course is expected to abide by the BRAC University Code of Academic Integrity. Students are encouraged to study together and to discuss information and concepts covered in lecture with other students. However, copying from another student or copying from published or unpublished or electronic sources without appropriate citations will be considered as plagiarism. Such dishonest practices will automatically result in students getting zero marks. During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any

collaborative behavior during the examinations will result in failure of the exam, and may lead to University disciplinary action.

VII. Accommodations for students with disabilities

I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Students are encouraged to register with Student Disability Services to verify their eligibility for appropriate accommodations.

VIII. Weekly course outline (Tentative)

Lecturers	TOPICS	TEXT REF.
Week 1	**Random Variable** 1. Random variable: Discrete, Continuous 2. Descriptive measures for discrete random variables: Expected value, Variance and Standard deviation of random variable. 3. Mean and variance of Linear functions of a random variable 4. Properties of expectation.	Newbold Chapter 4
Week 2	**Discrete Distribution** 1. Binomial Distribution	Newbold Chapter 4
	1. Poisson Probability Distribution	Newbold Chapter 4
Week 3	**Continuous Distribution** 1. Cumulative distribution function (Cdf) , Probability Density function(Pdf) 2. The Normal distribution. 3. Standard Normal distribution	Newbold Chapter 5
Week 4 & 5	**Sampling Distribution** 1. Sampling from a population, Sampling distribution 2. Sampling distribution of Sample mean	Newbold Chapter 6
	1. Central Limit Theorem 2. Sampling distribution of sample proportion	Newbold Chapter 6
	1. Sampling distribution of sample variance: Chi- Square Distribution	Newbold Chapter 6
	Point Estimation 1. Point Estimators: Point Estimator and Point estimate 2. Properties of a reliable estimator: Unbiased ness, efficiency, consistency	Newbold Chapter 7
	Interval Estimation 1. Interval Estimator: Confidence Interval and Confidence level. 2. Confidence Interval for a mean with known variance	Newbold Chapter 7

Week 6 & 7	1. Confidence Interval for a mean with Unknown variance 2. t Distribution 3. Confidence Interval for population proportion	Newbold Chapter 7
	1. Confidence Interval for the variance of a normal distribution 2. Confidence Interval for the difference between two means of two normal population	Newbold Chapter 8
	1.Confidence Interval for the difference between two population proportion	Newbold Chapter 8
	Test of Hypothesis 1. Concepts of Hypothesis testing: Null , Alternate Hypothesis, 2. Simple alternate Hypothesis, Composite Alternate hypothesis 3. One tailed and two tailed test	Newbold Chapter 9
	1. Test of the mean of a normal distribution: (Known Variance) One sided and two sided alternative. 2. P-value and its interpretation	Newbold Chapter 9
Lecturers	**TOPICS**	**TEXT REF.**
Week 8 & 9	1.Test of the mean of a normal distribution: (Unknown Variance) One sided and two sided alternative 2. Tests for the Population proportion 3. Test for a variance of a normal population	Newbold Chapter 9
	1. Tests for the difference between two population means: (Two Sample test of Hypothesis) 2. Tests for the difference between two population proportion	Newbold Chapter 10
	1. Testing of the equality of the variances between two normally distributed populations	Newbold Chapter 10
Week 10, 11 & 12	**Correlation and Regression Analysis** 1. Correlation Analysis 2. Test for zero population correlation 3. Introduction to Simple Regression model	Newbold Chapter 11 R/Rstudio
	1. Least Squares coefficient estimators 2. The explanatory power of a linear regression equation 3. Coefficient of Determination, R Square	Newbold Chapter 11 R/Rstudio
	1. Introduction to Multiple regression model 2. Regression Objectives	Newbold Chapter 12 R/Rstudio

	1. Estimation of Coefficients 2. Explanatory power of a multiple regression equation	(i)New bold Chapter 12
		(ii) Bekes Chapter 7 & 10 R/Rstudio
	1. Confidence Intervals and hypothesis tests for individual regression coefficient 2. Tests on sets of regression parameter (Global Test)	Newbold Chapter 12 R/Rstudio
	Prediction	Bekes Chapter 13 R/Rstudio

IX. Course Assessment Methods

(a) Attendance (5%)
(b) Quiz (20%)
(c) Assignment (10%)
(d) Mid Term (25%)
(e) Final (40%)

X. Assessment Methods vs. Course Outcomes:

Assessment Methods	**CO 1**	**CO 2**	**CO 3**	**CO 4**	**CO 5**
Quizzes	**X**	**X**	**X**		
Assignment			**X**		**X**
Examinations	**X**	**X**	**X**	**X**	**X**

Exam Schedule

Assessment Methods	**1**	**2**	**3**
Quizzes	TBA	TBA	TBA
Assignment	TBA	TBA	-
Midterm	Midterm Week		**Set by the Registrar's Office**
Final	Final Week		**Set by the Registrar's Office**

N.B. The course instructor reserves the right to edit/include/exclude topics considering the time constraint and THIRST FOR LEARNING !!