DEPARTMENT OF STATISTICS

FORMAN CHRISTIAN COLLEGE, LAHORE

(A Chartered University)

Semester: Spring 2023

Instructor Information:

Dr. Mujahid Rasul Professor

Course Information:

Title: Statistical Methods
Code: Stat 101/Math-107
Credits: 3
Prerequisite: None
Section: B

Recommended Book:

1) Lind, Marchal and Mason, Statistical Techniques in Business & Economics, International Edition.
2) Prof. Sher Muhammad Ch. And Prof. Dr. Shahid Kamal, Introduction to Statistical Theory Part 1, Ilmi Kitab Khana
3) R.S.N. Pillai and Bavanthi , Statistics theory and Practice, 8th Edition.

Course Objectives:

This course is intended to provide the student with an understanding of basic Statistical terminology and techniques. Upon the successful completion of the course the student should be able to translate information into data and learn how to summarize and present data and use them to solve every day statistical problems.

Learning Outcomes:

At the end of the course the student will:
1) Identify the types of data and use appropriate methods to collect and summarize data.
2) Be able to make a frequency distribution and draw its graphs,
3) Distinguish between different scales of measurements.
4) Be able to calculate different measures of central tendency and dispersion.
5) Analyze data to find moments, skewness and kurtosis and interpret the results.
6) Be able to understand basics of probability.
7) Be able find moments as expected values of random variables.

Course Requirements:

Statistical thinking is essential. Basic mathematical skills are also helpful. Students must know the use of scientific calculator and basic computer skills. Students are required to apply themselves diligently to the course of study and to prepare class and homework assignments as given. The assignments and Project will have to be completed on time.

Course Contents:

Nature and scope of statistics, Scales of measurements, Population and sample, measures of central tendency and dispersion for grouped data, moments, skewness and kurtosis, fundamental rules of counting, basic probability.

Course Evaluation:

Grading will be based on 3 assignments (worth 10% of the final grade), Quizzes(worth 10% of the final grade), Mid Term (worth 25% of the final grade), Final Term (worth 40% of the final grade), Class Participation (worth 5% of the final grade), project (worth 10% of the final grade). Late submission of the assignments will result in deduction of marks.
All students are expected to do their own work on all assignments. Academic dishonesty and / or plagiarism will result in the assignment of 'F' for the course grade and other university sanctions as they may apply.
Medium of instructions is English.

- All students enrolled in this course must submit their assignments and project before due date.
- For any query regarding your lesson and assignment please contact course instructor through email.
- In-case of Plagiarized work may cause deduction in scores.

Logistics:

Key Dates	Room #	Office hours	Contact Information
Deadlines mentioned on Assignments	S-421	12:00 p.m. to 01:00p.m. Monday, Tuesday, Wednesday and Thursday	Email: mujahidrasul@fccollege.edu.pk

The Grading Criteria

Grades	Quality Pts	Numerical Value	Meanings
A	4.00	93-100	Superior
A-	3.70	90-92	
B^+	3.30	87-89	
B	3.00	83-86	Good
B^-	2.70	80-82	
C^+	2.30	77-79	
C	2.00	73-76	Satisfactory
C^-	1.70	70-72	
D^+	1.30	67-69	
D	1.00	60-66	Passing
F	0.00	≤59	Failing
I	---	---	Incomplete

Lesson Plan:

Week	Objective	Topics; methods and resources	Assessments/Quizzes
Content cover Before Classes			
1	• Understand the term Statistics	Introduction to basic concepts and terminology, Measurement scales.	
2	• Learn the descriptive statistical methods to organize and summarize data	Data collection, Frequency distribution (Discrete data).	
3		Frequency distribution (Continuous data).	Quizz#1
4	• Learn what are measures of central tendency and how to calculate them • Understand how these measures differ and why	Measures of Central tendency • Arithmetic mean (direct, short-cut and coding method) • Merits and demerits of Arithmetic mean • Median ○ Power point presentation and suitable video links ○ Reading resource	Assignment 1

		○ Practice Questions worksheet	
5		Measures of central tendency (Cont.) • Quantiles (Quartiles, deciles, percentiles) • Merits and Demerits of median • Mode • Merits and demerits of mode ○ Power point presentation and suitable video links ○ Reading resource ○ Practice Questions worksheet	Quizz#2
6		Measures of central tendency (Cont.) • Geometric mean • Merits and demerits of Geometric mean • Harmonic mean • Merits and demerits • Relationship between Arithmetic mean, Geometric mean and Harmonic mean ○ Power point presentation and suitable video links ○ Reading resource ○ Practice Questions worksheet	
7	• Learn different measures of dispersion • Measures of dispersion show how spread out the data is?	Measures of Dispersion • Introduction to absolute and relative measures of dispersion • Range and coefficient of range • Semi-interquartile range, quartile	Assignment 2

		deviation and coefficient of quartile deviation • Mean Deviation (from mean and median) and coefficient of mean deviation ○ Power point presentation and suitable video links ○ Reading resource ○ Practice Questions worksheet	
8		Measure of Dispersion (Cont.) • Standard deviation and coefficient of variation • Skewness and Symmetry ○ Power point presentation and suitable video links ○ Reading resource ○ Practice Questions worksheet	Mid Term
9	• Understand 'moments' as a convenient method for summarizing several descriptive measures of statistics	Moments • Moments a) Moments about mean b) Moments about arbitrary value • Skewness and Kurtosis ○ Power point presentation and suitable video links ○ Reading resource ○ Practice Questions worksheet	Assignment 3 Quizz#3
10		Moments • Moments c) Moments about mean	

		d) Moments about arbitrary value • Skewness and Kurtosis ○ Power point presentation and suitable video links ○ Reading resource Practice Questions worksheet	
11	• determine the concept of probability • infer the importance of probability in real-life able to distinguish the similarities and differences between permutations and combinations	Probability • Random Experiment and events • Fundamental Counting Principle • Permutation • Combination ○ Power point presentation and suitable video links ○ Reading resource Practice Questions worksheet	
12	• Apply statistical techniques learned on real life scenario	Final Project	Final Project
13		• Introduction to probability, classical and relative frequency approach ○ Power point presentation and suitable video links ○ Reading resource Practice Questions worksheet	
14		• Introduction to probability, classical and relative frequency approach ○ Power point presentation and suitable video links	**Quizz#4**

		○ Reading resource Practice Questions worksheet	
15		Probability • Random Experiment and events • Fundamental Counting Principle • Permutation • Combination ○ Power point presentation and suitable video links ○ Reading resource Practice Questions worksheet	**Quizz#5**
16	Final Term Exam		**Final Term**