Course Name: **Probability and Statistics**		
Course Code: STAT 115	**Course Type :** Elective	**Course Credits:** 3
Class Timings: Tuesday and Thursday 11:00-12:15	**Section:** B	**Online Office Hours (Zoom):** M, W, F: 10:00-11:00
Instructor Name: Dr. Nadia Mushtaq		

A Note from the Instructor:

- *Policy for in-class students*

- *Lectures will be delivered in class face to face*
- *Lecture and reading Material will be uploaded on Moodle*
- *Quizzes will be performed on Moodle during Class time. Dates will be announced in-class and on Moodle*
- *Assignments will be provided on Moodle and submissions are also required on Moodle. Assignment Feedbacks will be uploaded on Moodle.*

-Policy for online students

- *Recorded Lectures will be uploaded on Moodle*
- *Reading Material will be uploaded on Moodle*
- *Quizzes will be performed on Moodle during Class time. Dates will be announced on Moodle*
- *Assignments will be provided on Moodle and submissions are also required on Moodle. Assignment Feedbacks will be uploaded on Moodle.*

Instructor Contact Details

Email: nadiamushtaq@fccollege.edu.pk

Office Hours (online): M,W,F 10:00 to 11:00a.m.

Zoom Meeting ID: lxxtw33~ssq2yw3;69:8=9564Ct{hAgo^[RIt|U5ZyW[VGeLp6Y~puhXU9^~4=$

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Guidelines for contacting instructor:

- Meet online
- If in-person make an appointment via email

Course Description:

Pre-requisites if any:

Mode of Instruction: Asynchronous/ Synchronous

Mode of peer-to-peer Contact Among Students: online discussion forums

Main Mode of Instruction: *Moodle, Zoom and MS Teams*

Technology Requirements:

- Students need to have a computer/ laptop/ smartphone/ calculator

Technology Etiquettes

- Students are recommended to log in at least 10 minutes before the start of the session to do the necessary checks, specifically for students

- Be sure to name yourself for your slot on the screen. It will make it easy to get a report of the students' attendance. If your slot carries a different name, to rename: click 3 dots near your video window OR in the participants' list, hover over your name, and click "rename" to make the change
- Please stay muted when not speaking.
- Please turn off your video during class.
- Be respectful of others' opinion
- If the session is recorded do not post isolated comments that may be taken out of context.

Considerations for Students with Limited Internet/Technology Access:

- Student with limited internet connections may send an email to instructor with their concern.

Course Objectives or Student Learning Outcomes (SLOs)

This course is designed to provide students majoring in Computer Sciences introductory survey of descriptive and inferential statistics. We first review techniques for organizing and presenting the raw data and elementary probability theory and some important discrete or continuous distributions. Next, we discuss few techniques to make inferences with single and multiple regression analysis, model building, and correlation.

Student Learning Outcomes:

At the end of the course the student will:

1) To develop statistical thinking and introduce students to descriptive as well a bit of inferential statistics
2) To enable students to accomplish empirical projects by using appropriate statistical methods
3) To enable students to critically assess statistical studies
4) To serve as a sound foundation for Computer Science courses

Course Content, Learning Material & Activities Schedule

The schedule is tentative because it is not possible to anticipate exactly how much time each topic will require. Pl check out the online resources and alternate options for instructional tasks as linked below.

Wk	Topic/ Title	Teaching-Learning Activities		Assessment & Rubrics (with the due date)
		Synchronous (Simultaneously conducted) *Presentation / Lecture, Live Video-Audio, Small Group Discussion/ Breakout Rooms, In-class quiz, Q&A/ Live Chat*	**Asynchronous** (postal/ Moodle/ email) *Discussion blogs, WhatsApp, Readings, Moodle Quizzes, Assignment Submission, Online Content/ Recordings, Lecture notes/ Annotated PPT, Experiential learning*	
		In-Person	Off-campus and offline	
1	Introduction to basic concepts and terminology. Measurement scales.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentations	

	Data, Types of Data. and its representations.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
2	Frequency distribution	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Quiz 1
	Graphs and Charts (Pi-chart, bar-graph, histogram)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
3	Measures of Central tendency (mean , median, mode, quantiles)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Cont.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
4	Measures of dispersion (Range, mean deviation, standard deviation)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentations	Assignment 1
	Cont.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
5	Random Variables and Probability Distributions (Discrete and continuous random variables)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Quiz 2
		In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
6	Introduction to Probability: Events, Sample Spaces and Probability; General Probability Rules; Unions and Intersections; Complementary Events;	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Assignment 2
		In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
7	The Additive Rule and Mutually Exclusive Events; Conditional Probability	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
		In-class lecture	Moodle Quizzes, Readings,	Quiz 3

			PowerPoint Presentation	
8	Multiplicative Rule and Independent Events; practice questions, Bayes' Theroem	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
		In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
MIDTERMS if applicable				
9	Discrete Distributions (Binomial distribution and Poisson Distribution)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Cont.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Assignment 3
10	Continuous Distribution (Normal Distribution)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Cont.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
11	Simple Linear Regression	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Probabilistic Models; Fitting the Model Conduct inference for the slope and intercept parameters	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Quiz 4
12	Multiple Regression and Model Building (Define the concept of Least Squares Regression in Multiple	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	

	Regression)			
		In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Assignment 4
13	Correlation (the coefficients of correlation of Least Squares Regression in multiple Regression)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Cont.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
14	Cont.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Revision			
15	**FINAL PROJECT**			
16	**FINAL EXAM**			

'Out-of-class' Study Required (across all 3 categories of students -- those attending in-person, online, or asynchronously)

1. Quizzes will be online at the time of class
2. Students are expected to study 3 hours a week
3. If you have any questions please join online office hours
4. Assignment submissions will be on Moodle

Textbooks, Materials, Supplies and other Resources

1. Lind, D. A., Marchal, W. G., & Wathen, S. A. (2012). *Statistical techniques in business & economics*. New York, NY: McGraw-Hill/Irwin,
2. Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2016). *Statistics for business & economics*. Nelson Education
3. Prof. Sher Muhammad Ch. And Prof. Dr. Shahid Kamal, Introduction to Statistical Theory Part 1, Ilmi Kitab Khana.
4. Mann, P. S. (2007). *Introductory statistics*. John Wiley & Sons.
5. R.S.N. Pillai and Bavanthi, Statistics theory and Practice, 8th Edition.

Course Requirements:

Class Participation

Attendance and participation in discussions

Quiz 1 : (marks 10)

Topic: Introduction to basic concepts and terminology, Measurement Scale, Data collection and Frequency Distribution

Quiz 2 : (marks 10)
Topic: Charts and Graphs, Measures of central tendency and Measures of dispersion

Quiz 3 :(marks 10)
Topic: discrete and continuous random variables, events, sample space, probability, additive rule and conditional probability, Multiplicative rule.

Quiz 4: (marks 10)
Topic: discrete probability distributions and continuous probability distributions and correlation.

Assignment 1 : (marks 10)
Topic: Frequency distribution, Graphs, Measures of central tendency and Measure of dispersion using R.

Assignment 2 : (marks 10)
Topic: Charts and Graphs, Measures of central tendency and Measures of dispersion using R.

Assignment 3 : (marks 10)
Topic: Discrete and continuous random variables, events, sample space, probability, additive rule, Multiplicative rule and conditional probability

Assignment 4: (marks 10)
Topic: Discrete and Continuous probability distribution, Correlation and coefficient of determination.

Assigned Readings
Practice worksheets/ Questions

The breakup is as follows:

Class Participation	5%
Assignments:	15%
Quizzes:	10%
Midterm exam:	25%
Final term exam:	30%
Project	15%
TOTAL	**100%**

[OPTIONAL] Missed Assignments/ Make-Ups/ Extra Credit
- *No delayed assignments.*
-No Make-up class and exam
-No retake exam

Attendance Policy:
If a student does not attend a minimum of 70% of total classes, he/she will not be permitted to take the final examination in the course.

Classroom Participation:
--Students attendance will be covered in your class participation, according to your odd/even roll numbers.

Grading Legend
Below is the grading legend of FCCU (published in all catalogues and available on the FCCU website) as approved by the Academic Council and applies for Fall as well

Grade	Point Value	Numerical Value	Meaning
A	4.00	93-100	Superior
A-	3.70	90-92	
B+	3.30	87-89	Good
B	3.00	83-86	
B-	2.70	80-82	
C+	2.30	77-79	Satisfactory
C	2.00	73-76	
C-	1.70	70-72	
D+	1.30	67-69	Passing
D	1.00	60-66	
F	0.00	59 or below	Failing

Student Conduct & Other Issues:
- Consider including ground rules for appropriate classroom interactions, as well as a clear statement of expectations that classroom interactions will remain civil, respectful, and supportive.
- If any student faces any issues or has any concerns regarding the classroom climate and interactions, please feel free to contact VR office gloriacalib@fccollege.edu.pk

Changes to the Syllabus:
This syllabus was designed to convey course information and requirements as accurately as possible. It is important to note however that it **may** be subject to change during the course depending on the needs of the class and other situational factors. Such changes would be for your benefit and you will be notified of them as soon as possible.

Student Support Services

Student Counseling Services
Writing Center
Mercy Health Center

Other Useful Policy Documents:

Sexual Harassment Policy
Anti-Corruption Policy
Academic integrity
Plagiarism Policy
Academic Calendar

I expect that you will strictly follow the core values of FCCU and put your entire efforts to learn as per the course requirements, attend classes, read the textbook(s)/other assigned reading material and do the assignments in the stipulated time period.