Course Name: **Statistical Inference I**

Course Code: STAT 201	**Course Type :** Elective	**Course Credits:** 3
Class Timings: 10:00 – 10:50 p.m. **(MWF)**	**Section:** A Room: S - 421	**Office Hours (In-Person):** 1100 to 1200 MWF

Instructor Name: **Muhammad Anwar Mughal *Ph.D.***

A Note from the Instructor:

- *Policy for in-class students*

- *Lectures will be delivered in class face to face*
- *Recorded Lecture and reading Material will be uploaded on Moodle*
- *Quizzes will be accomplished through Moodle during Class time. Dates will be announced in-class as well as on Moodle*
- *Assignments will be posted on Moodle and submissions are also executed through Moodle.*
- *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 accomplished through Moodle during Class time. Dates will be announced on Moodle*
- *Assignments will be posted on Moodle and submissions are also executed through Moodle.*
- *Feedbacks will be uploaded on Moodle.*

Instructor Contact Details

Email: anwarmughal@fccollege.edu.pk

Office Hours (In-Person): Monday Wednesday Friday- 11:00 to 12:00 p.m.

Guidelines for contacting instructor:

- For online meeting 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, Google meet*

Technology Requirements:

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

Technology Etiquettes

- In scheduled classes 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.

OPTIONAL]: Program Objectives Addressed (which goals of the academic program/department does this course address?)

A. Demonstrate knowledge about basic statistical concepts, terms and techniques
B. Analyze various types of data and interpret the results effectively
C. Think critically about applications of Statistics in various fields
D. Practice high moral and ethical values in their personal and professional lives and in their communities

Course objective/learning outcomes

At the end of the course the student will:

1) Have knowledge of the sampling distributions and their properties and applications.
2) Be able to use appropriate sampling distributions for interval estimation and hypotheses testing.
3) Be able to use appropriate inferential procedures to handle the practical situations.

Course Content, Learning Material & Activities Schedule

Wk	Topic/ Title	Teaching-Learning Activities		Assessment & Rubrics
		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 Inferential Statistics	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentations	
	Introduction to basic concepts and terminology	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
2	Sampling distribution of sample means	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	

	(with and without replacement) and related properties			
	Cont.	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
3	Sampling distribution of sample proportion (with and w.o.r) and related properties	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Quiz 1
	Cont..	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
4	Sampling distribution for difference between two sample means and related properties	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentations	Assignment 1
	Sampling distribution for difference between two sample proportions and related properties	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
5	Testing of Hypotheses, steps and procedure,	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	related concepts and application	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
6	Testing hypothesis about population mean for known σ and large sample	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Quiz 2
	Testing hypothesis about population mean for unknown σ and small sample	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Assignment 2
7	Testing hypothesis about difference between two population's means for known	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	

	variances and/or large samples			
	Cont..	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Assignment 2
8	Testing hypothesis about difference between two population's means for unknown(equal/unequal) variances	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Cont..	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
MIDTERMS if applicable				
9	Testing hypothesis about 1- population proportion	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Testing hypothesis about equality of two populations proportion	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
10	Testing hypothesis about difference between two population's proportion	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Quiz 3
	Cont..	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Assignment 3
11	Introduction to Point and interval estimations	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Estimation by Confidence intervals about mean(s)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
12	Estimation by Confidence intervals about mean(s) under t-test	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	

	Estimation by CI for proportion(s)	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
13	Criteria for good point estimators; unbiasedness, efficiency, consistency and sufficiency	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
	Concept and application of four criteria	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Quiz 4
14	Methods of estimation; method of moments, least squares	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	Assignment 4
	Method of maximum likelihood estimation	In-class lecture	Moodle Quizzes, Readings, PowerPoint Presentation	
15	**CULMINATING 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 question please join online office hours
4. Assignment submissions will be on Moodle

Textbooks, Materials, Supplies and other Resources

- Mason, Lind, and Marchal, "Statistical Techniques in Business and Economics" McGraw Hill, New York.
- Anderson, Sweeney and Williams, "Statistics for Business and Economics" 9e Thomson South-Western.
- Prof. Sher Muhammad Ch. And Prof. Dr. Shahid Kamal, Introduction to Statistical Theory Part 1, Ilmi Kitab Khana.

Course Requirements:

Class Participation

Attendance and participation in discussions

Quiz 1 : (marks 10)
Topic: sampling distribution of sample means and proportions with properties.

Quiz 2 : (marks 10)
Topic: Testing hypothesis about population mean and proportion

Quiz 3 :(marks 10)
Topic: Testing hypothesis about two population means under Z-test and t-test

Quiz 4: (marks 10)
Topic: Criteria about good point estimators

Assignment 1: (marks 10)
Topic: Hypothesis testing about single and two means
Assignment 2 : (marks 10)
Topic: Hypothesis testing about single and two proportions
Assignment 3 : (marks 10)
Topic: Point and Interval estimation
Assignment 4: (marks 10)
Topic: Estimation methods

Note: The topics and numbers of (Assignments and quiz) are tentatively suggested above it may vary according to situation.

Assigned Readings
Practice worksheets/ Questions

The breakup is as follows:

Class Participation	**5**%
Assignments:	20%
Quizzes:	15%
Midterm exam:	20%
Final term exam:	30%
Project	10%
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 must participate in classroom for class activities and may ask questions related to lesson taught.

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

Developed by CLT (2020) from:
FCC Policy for Fall Semester 2020
https://www.aascu.org/
https://blended.online.ucf.edu/

Note:
Pl see https://unitguides.mq.edu.au/ for additional options. Macquarie University has their syllabus online (called Unit Guides and are publicly viewable)
See additional information for Syllabus Checklist and for How to Create a Syllabus

Please also consider High Impact Practices for your classes