

## Syllabus/ Course Outline Stat-202

*This template has been made in keeping with the HEC and FCCU policies*

<b>Course Name: Statistical Inference II</b>		
<b>Course Code: Stat-202</b>	<b>Course Type: Elective/Major</b>	<b>Course Credits: 3</b>
<b>Class Timings: 12:00-12:50 MWF</b>	<b>Section: A</b>	<b>Student Meeting Hours/ Office Hours: 10:00-12:00 TR</b>
<b>Instructor Name: Samia Ayub</b>		
<p><b>A Note from the Instructor:</b></p> <p>Students are required to apply themselves diligently to the course of study and to prepare class and homework assignments as given. Lecture slides/Reading Material will be uploaded on Moodle. Class tests and quizzes will be announced in the class. The assignments and Project will have to be completed on time. Regularity and punctuality in the class is essential. All deadlines will be announced in classes.</p>		
<p><b>Course Description:</b></p> <p><i>Pre-requisites if any: None</i>  <i>Mode of Instruction (Asynchronous/Synchronous): Face to Face</i>  <i>Mode of peer-to-peer contact among students: WhatsApp Discussion Groups</i></p>		
<p><b>Technology Requirements:</b></p> <p><i>Technology Usage in the classroom.</i></p> <ul style="list-style-type: none"> <li>• Students are required to have a computer/laptop and calculator.</li> <li>• During exams scientific calculator is mandatory and smartphones are not allowed.</li> </ul> <p><i>Main Mode of Instruction: Lecture slides, reading material, assignment questions will be uploaded on Moodle</i></p>		

**Course Objectives/By the end of the course students will be able to:**

This course is intended to provide the conceptual knowledge of Statistical Inference, its branches and usage. Chi-Square variable and its probability distribution, Application of Chi-Square statistic regarding population variance, independence of attributes, goodness of fit etc. Classification of ANOVA methods. Introduction to parametric and nonparametric tests and their application.

**Student Learning Outcomes:**

At the end of the course student would be able to:

1. Brief knowledge about statistical inference, its branches and usage.
2. Analyze the data where ever Chi-Square distribution is suitable or applicable.
3. Understanding of basic ANOVA methods and their application.
4. Differentiate between parametric and nonparametric tests.
5. Application of nonparametric techniques in daily life problems.

**Course contents, Learning Material & Activities Schedule**

<b>Week #</b>	<b>Topic/ Title</b>	<b>Instructional Material</b>	<b>Assessment</b>
1.	Introduction to statistical inference, its branches and usage in various fields.	PowerPoint Slides, worksheets, activities and Reading Material	
2.	Introduction to Chi-Square variable, its probability distribution and statistic. Its usefulness and importance.		
3.	Statistical inference regarding population variance (Estimation and Testing).		Quiz #1 Introduction to Statistical Inference and Chi-Square
4.	Chi-Square test for goodness of fit, Yates correction for continuity		
5.	Chi-Square test for independence of attributes		

6.	Chi-Square test as a test of Homogeneity	PowerPoint Slides, worksheets, activities and Reading Material	Assignment #1 Application of Chi-Square Tests
7.	Introduction to Analysis of Variance, its classification, importance and application.		
8.	Partitioning sum of squares for both one and two-way ANOVA. Partitioning of degree of freedom for one and two way ANOVA.		Quiz 2 (ANOVA)
<b>MID TERM</b>			
9.	Multiple comparison tests and their usage	PowerPoint Slides, worksheets, activities and Reading Material	
10.	Introduction to Parametric and Nonparametric Tests, their usage and importance with respect to statistics and social sciences.		Assignment # 2 (One-way , Two-way ANOVA, Tests)
11.	The Sign Test. The Wilcoxon Signed Rank Tests, Application of these tests		
12.	The Mann-Whitney U Test and its application.		
13.	The Median Test and its application. Daily life problems		
14.	The Kolmogrov-Smirnov Test, its importance and application and various situations.		Quiz # 3 (Non-Parametric Tests)
15.	The Kruskal-Wallis H Test, its usefulness and application		
16.	Final Project		
<b>Final Exam</b>			

**Note:**

- Assessments can be divided into formative and summative:
  - Formative:
    - Students will learn through readings material, lesson notes, group discussions, and lecture slides, etc.
    - Students will practice through worksheets, practice questions and activities etc.
  - Summative:
    - Performance will be assessed through quiz, case study, projects, etc.

**Out-of-Class Study Required:**

*After completion of a topic exercise questions will be provided to the class to prepare for class and/or complete weekly homework. The “best practices” for maximizing their learning is to take notes and review whole work done at the weekend. At least two hours daily study required to pass this course.*

**Textbooks, Materials, Supplies, and other Resources**

1. Rudolf J. Freund & William J. Wilson (2003): Statistical Methods, Academic Press Elsevier Science (USA).
2. Sher Muhammad Chaudhry & Shahid Kamal (2010): Introduction to Statistical Theory (Part-II), Ilmi Kitab Khana, Lahore.
3. Paul G. Hoel (1966): Introduction to Mathematical Statistics, John Wiley & Sons inc. New York.
4. Gopal K. (2006): 100 Statistical Tests, Sage Publications, New Delhi.

**Course Requirements:**

**Class Participation:** Class attendance; participation in-class activities and discussions

Assignment 1: Application of Chi-Square Tests

Assignment 2: One-Way, Two-Way ANOVA, Multiple Comparisons Test.

Quiz 1 (marks 10): Introduction to Statistical Inference & Chi-Square

Quiz 2 (marks 10): ANOVA

Quiz 3 (marks 10): Non-Parametric Test

Assigned Readings

Practice Worksheets/ questions and reading documents

**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

Grades	Quality Points	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	Satisfactory
C+	2.30	77-79	
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
NS	0.00	0.00	Did not show up in class
W	-	-	Officially Withdrawn
AW	-	-	Administrative Withdrawal/Dismissal
AU	-	-	Audit/Listener Status
I	-	-	Incomplete
T	-	-	Transferred credit

The entire course is worth 100%, the breakup is as follows (for example):

<b>Class Participation</b>	5%
<b>Assignments:</b>	10%
<b>Quizzes:</b>	10%
<b>Midterm exam:</b>	25%
<b>Final term exam:</b>	40%
<b>Final Project</b>	10%
<b>TOTAL</b>	<b>100%</b>

Missed Assignments/Make-Ups/Extra Credit

- *NO delayed assignments. There will be 50% deduction of marks for late submission after due date.*
- *NO Make-up mid/final exam*
- *NO retake mid/final 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 the classroom for class activities and may ask questions related to the lesson taught. Class participation is also included in your grade

### **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**

- Students can contact the [Campus Counseling Center](#) at 0331-444-1518 or [ccc@fccollege.edu.pk](mailto:ccc@fccollege.edu.pk).
- [Writing Center](#)
- [Mercy Health Center](#)

### **Other Useful Links:**

- [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*