



# FORMAN CHRISTIAN COLLEGE, LAHORE

(A Chartered University)

Course Outline for Fall 2021

## **Instructor Information:**

Dr Faira Kanwal Janjua

Assistant Professor

Office: S 110 (Armacost Science Building)

[fairajanjua@fccollege.edu.pk](mailto:fairajanjua@fccollege.edu.pk)

## **Office Hours And Online Office hours:**

DAYS	Office hours
MWF	9:00am-9:50am 11:00am-11:50am
T,R	11:00am-12:00pm

Zoom ID:993 235 9744

(For online office hours students need to join the zoom link is given above)

## **Course Information:**

**Title:** Topology and Metric Spaces

**Code:** MATH 311

**Section:** A

**Credits:** 3

**Class Room:** S213

**Lectures Time:** MWF 10:00-10:50

**Prerequisite:** Math 210

## **Recommended Books**

1. Course pack Math 311( Available in library).
2. "Introduction to General Topology" by M.Amin, Ilmi Kitab Khana, Lahore.

## **Course Contents:**

Introduction to metric spaces, open set and closed set, Neighbourhoods, Convergence of a sequence and Cauchy sequence, Completeness of the metric spaces. Introduction to Topological space. Basis and sub-basis. Continuity and Homeomorphism, Compactness and connectedness and Separation Axioms.

## **Course Goals:**

Upon successful completion of the course, students should be able to:

- To know the concepts of open and closed set, neighbourhoods and continuity and use these in a general setting.
- To apply geometric thinking (e.g a metric, Continuity) in Analytic problems.
- To enhance their abstract thinking in solving the problems.
- To understand the deep branches of Topology in Geometry.
- To have a Basis for the study of future mathematical subjects such as analysis, Functional analysis or geometric topology.

### **Course Policies:**

- Basic blended model will be the mode of conduct/ teaching. It will involve face to face class sessions (on-campus) that are accompanied by online lectures (lecture recordings on Moodle) – essentially a “blend” of both on-campus and online learning through recorded lectures.
- **In case if the university switch to online teaching due to Covid than online zoom sessions will be conducted( Viva in that case will be conducted).**
- Students with odd roll numbers (last digit) will be allowed on campus for the first two weeks of class and those with even roll numbers (last digit) will learn remotely through the recorded lectures. After two weeks, those with even id numbers will come to campus for in-person classes and those with odd id numbers will learn from home through lecture recordings. Every fortnight, the students will switch who is on campus and who is studying remotely.
- Students are expected to watch every video lecture and read the lecture notes uploaded on Moodle. Off-campus students can discuss their queries/ questions in the given online office hours.
- Students are expected to attend every class. Students must arrive at class on time, should remain in class for the entire class period and mobile phone should be switched off or on silence. Note that there is 5 marks for attendance, behavior and class participation. if a student arrives more than 10 minutes late or leave class during lecture or use mobile in class, he/she will be marked absent.
- Course assessment will be through **quizzes; attendance, behavior and class participation; assignments; midterm and final exam.**
- Quizzes, Mid-term exam and final exam will be conducted on campus for both even and odd ID students. Assignments will be conducted on Moodle. There is **no make up** for the missed quizzes and assignments. Make up for quizzes, midterm and final exam is possible only under extremes cases if a student provides strong documentary evidence. In case of make-up exam there will be

a 0-20% deduction in marks depending upon case to case basis.

- Academic dishonesty or cheating will result in zero points (grade F) and will be referred to AIC (Academic Integrity Committee) at FCC for necessary action.

### **Course Evaluation**

Assignments/Presentations	10%
Midterm Exam	30%
Final Exam	40%
Quizzes( 2 out of 3)	15%
Class Participation /Attendance/Class Behavior	5%

<b><u>Grades</u></b>	<b><u>Quality Points</u></b>	<b><u>Numerical Value</u></b>	<b><u>Meaning</u></b>
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 or below	Failing

### **Course Outline**

<b>Weeks</b>	<b>Topics</b>	<b>Assessment</b>
--------------	---------------	-------------------

1	Discussion of the course plan, Policies, Requirement, Grading. Open interval closed interval. Introduction to metric spaces	
2	Examples on Metric Spaces Neighbourhoods	Quiz#1
3	Open sets in Metric Spaces Closed Sets in Metric Spaces	Assignment Moodle
4	Topological Spaces and Examples	
5	Neighborhoods in Topological Spaces	Quiz#2 On Campus
6	Basis and Sub basis for topology	
7	Limit points and closure of a set.	
8	Continuity in Metric Spaces and Topology	<b>Mid</b> On campus
9	Homeomorphism	
10	Product and Quotient Topology	
11	Compact Spaces	
12	Connectedness	Quiz#3
13	Complete Metric spaces	Presentations
14	Separation Axioms	
15	Examples	Quiz#4

**\*\*Contents distribution week wise may change depending on the students understanding.**