FORMAN CHRISTIAN COLLEGE, LAHORE
(A Chartered University)
Course Outline for Spring 2023

Instructor Information:

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Office Hours:

Monday, Wednesday, Friday : 9:00 AM – 10:00 AM

11:00 AM – 11:50 AM

Course Information:

Title: Multivariate Calculus
Course Code: CSCS 201 (C)
Credit Hours: 3
Lectures Time: MWF: 12:30-1:45 PM (S-413)
Prerequisite: Math 111

Recommended Books:
- Calculus Early Transcendentals, James Stewart, 8th edition.
- Calculus and analytic geometry by Thomas and Finney, 13th edition

Course Introduction and Contents

This course is an extension of the Calculus in single variable. Course contents include the Introduction to functions of several variables, Limits & Continuity for functions of two and three variables, Partial derivatives, Chain rule, Tangent planes and Gradient vectors, Double & Triple Integrals with their applications, Line and Surface Integrals, Green's and Stokes' Theorem.

Learning outcomes:

Students will be able to

- Develop and strengthen skills in dealing with multivariate functions.
- Evaluate and make analysis regarding the limits and test the continuity of functions of several variables.
- Differentiate the multivariate functions apply them to real world problems.
- Explore and evaluate the integrals in higher dimension using double and triple integrals
- Use Green's, Stokes' and Gauss' theorem to analyze and solve line and surface integrals.

Course Policies:

- 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. Students failing to maintain at least 70% attendance will not be allowed to appear for Final Exam.
- Course assessment will be through Quizzes, attendance, assignments, midterm and final exam.
- There will be **no make up for the missed quizzes and Midterm exam**. There will be 4 Quizzes and best 3 will be considered while making aggregate. Make up of midterm and final exam is possible only under extremes cases if proper documentary evidence is provided. 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.

Course Evaluation

Assignments	10%
Attendance/Class participation	5%
Quizzes (3 out of 4)	15%
Midterm Exam	30%
Final Exam	40%

GRADING SCALE

Grades	Quality Points	Numerical Value	Meaning
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	Fair
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

Week	Topics	Assessment
1	Functions of several variables, Level curves and Level surfaces	
2	Limits for multivariable functions	
3	Continuity for multivariable functions	
4	Partial derivatives	**Quiz 1**
5	Chain rule	
6	Directional derivatives and gradient vectors	**ASSIGNMENT 1**
7	Double Integrals over rectangular regions	**Quiz 2**
8	Double Integrals over general regions	
9	Double Integrals (continued)	**Mid Term**
10	Double Integrals in polar coordinates	
11	Triple Integrals	
12	Triple Integrals	
13	Line Integrals	**Quiz 3**
14	Green's Theorem	
15	Surface Integrals	**ASSIGNMENT 2**
16	Gauss' Theorem	**Quiz 4**
17	Revision	