

Forman Christian College, Lahore
(A Chartered University)
Department of Mathematics
Spring 2023

Instructor Information

Kamran Azhar

Assistant Professor

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Office Hours:

Mon, Wed, Fri : 9:00a.m – 9:50a.m & 11:00a.m – 11:50a.m

Course Information:

Title: Calculus I

Code: Math 102

Prerequisite: Math 101 (Pre-Calculus and Trigonometry) or *A-level Mathematics or Intermediate Mathematics*

Credit hours: 3

Recommended Text:

Calculus by Howard Anton, 10th edition.

Resources:

Video lectures and pdf lectures will be uploaded on Moodle.

Course Introduction:

This is first course in Calculus and it will provide foundational knowledge of differential and integral Calculus. This course will develop a clear understanding of limits and continuity of functions, derivative of a function and techniques of differentiation, indefinite integration and various techniques of solving integrals. It will prepare students for next level courses in mathematical sciences. Topics include Functions, Graphs of functions, Translation, Stretching and Compressing graph, Limits, Continuity, Differentiability and Integration with application, Introduction to definite integrals.

Learning Outcomes:

After successfully completing this course, the students would be able to:

- demonstrate a good understanding of the basic concepts of differential and integral Calculus.
- develop techniques for solving application problems.
- comfortably prepare themselves for higher level courses in mathematics.

Course Requirements :

Students are expected to attend every class and to arrive at each class on time and remain in class for the entire class period. Instructor may choose to lower a student's grades because of tardiness. Consult the instructor during office hours. If your visit may tend to be lengthy, make an appointment with the instructor so that he may set aside some time for you. Cellular phones will be turned off while the student is in the classroom. No cell phone calculators are to be used in quizzes, mid term and final exams. Course assessment will be through quizzes, assignment, attendance and behavior, midterm, and final exam.

There will be no make up quiz, mid term or final exam. Only make up of mid term or final can be considered if solid proof will be provided within three days after exam. In case of make up exam there will be a 0-20% deduction in marks depending upon case to case basis.

Course Evaluation:

Grading will be based on following criteria:

Attendance, In class performance & behavior	5%
Homework	10%
Quizzes (4 and best 3 will be counted)	15%
Mid Term	30%
Final Exam	40%

<u>Grades</u>	<u>Quality Points</u>	<u>Numerical Value</u>	<u>Meaning</u>
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	Discussion of Course Plan, Real Numbers and Real Line, Intervals, Inequalities, Absolute Value, Coordinate Planes and Graphs	
2	Functions, Operations on Functions, Graphs of Functions	
3	Limit (Computational techniques), Limits at infinity;	QUIZ-1
4	End behavior of a function, Continuity	
5	Limits and Continuity of Trigonometric Functions	
6	The derivative Techniques of Differentiation,	QUIZ-2
7	Derivative of Trigonometric Functions, The Chain Rule,	
8	Implicit Differentiation L'Hopital's Rule	MID-TERM
9	The Indefinite Integral, Integration by Substitution	
10	The First Fundamental theorem of Calculus, Integrals of Logarithmic and exponential Functions	
11	Integrals involving Inverse Trigonometric Functions Integration by Parts	
12	Integrating powers of sine and cosine, Integrating powers of secant and tangent	QUIZ-3
13	Trigonometric Substitution,	
14	Integrating Rational Functions, Partial Fractions,	
15	Miscellaneous Substitutions, Definite integrals	QUIZ-4
16	FINAL EXAM (from full course)	