Forman Christian College, Lahore

(A Chartered University)
SPRING 2023

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Fri: **11:00 a.m. – 01:00 p.m.**
Tues, Thurs: **11:30 a.m. - 12:30 p.m.**

Course Information: Pre-Calculus and Trigonometry   Math 101 (A)
Prerequisite: None   **Credit Hours:** 3
Class Room: S-413   **Class Timings:** 10:00 a.m. -10:50 a.m. (Mon, Wed, Fri)
Course Trailer Link: https://www.youtube.com/watch?v=UNRTu-Wnk70

Resources:
- Course pack (sections from the textbook) will be uploaded on Moodle.
- Recorded video lectures and lecture notes will be uploaded on Moodle every week.
- ***Text Book:*** PRECALCULUS Functions and Graphs by Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen 5th Edition.

Course Contents: This is a general education course for Mathematics. Course content include the following: Fundamentals, solution of equations and inequalities, lines, functions, linear and quadratic functions, polynomial and rational functions, operations on functions, inverse functions, synthetic division, remainder and factor theorem, partial fractions, exponential, logarithmic and trigonometric functions, trigonometric identities, solution of right and oblique triangles.

Course Objectives: The course will help students to:
- Tackle math word problems using algebra.
- Understand the basic concepts of functions and their applications to daily life.
- Learn to relate the idea of straight line and linear equations to the physical problems like motion in straight line, steepness, and rapid change in things, etc.
- Recognize and utilize the logical understanding in mathematics.
- Demonstrate competence in the use of numerical, graphical, and algebraic representations.
- To prepare the students to be able to apply Pre-Calculus methods to other disciplines e.g., Computer Sciences and Economics, etc.

Course Requirements:

- **Attendance:** Students are expected to attend every class. Student whose attendance is less than 70% will not be allowed to take the final exam. 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 silent mode. Note that there is **5 marks for attendance, behavior, and class participation**, if a student arrives more than **10 minutes late** or **leaves class during lecture** or **uses mobile in class**, he/she will be marked **absent** for that day.
- **Assessments:** Course assessment will be through **quizzes, attendance and behavior, assignments, midterm, and final exam**. There is no make up for missed quizzes. Make up for quizzes, midterm and final exam is possible only under extremes cases if student provides strong documentary evidence within three days. In case of makeup exam, there will be a 0-20% deduction in marks depending upon case-to-case basis.
- **Academic dishonesty or cheating:** Students are expected to present their own work, failure to do this will result in zero points and will be referred to AIC (Academic Integrity Committee) at FCC for necessary action.

Learning Outcomes: Upon successful completion of this course, the students will be able:

- To understand the main ideas, they need to know to start calculus.
- To be able to understand the various kinds of functions based on diverse properties.
- To learn new methods to solve algebraic expressions and make concluding remarks by analyzing the obtained solutions.
- To be able to make connection between algebra and Geometry.

Course Evaluation: Grading will be based on following criteria:

❖ **Quizzes** (three quizzes and each having 5% weightage)	**15 %**
❖ **Attendance, class participation and behavior**	**05 %**
❖ **Assignments** (two assignments and each having 5% weightage)	**10 %**
❖ **Mid-term Exam**	**30 %**
❖ **Final Exam**	**40 %**

Grading Criteria:

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	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

Weekly Lesson Plan:

Week	Topics (section number from the text book)	Assessments
1 Feb 13, 15, 17	❖ Discussion of course plan and overview of course syllabus ❖ Linear equations and applications (1.1) ❖ System of linear equations and applications (1.2)	
2 Feb 20, 22, 24	❖ Linear inequalities (1.3) ❖ Absolute value in equations and inequalities (1.4)	
3 Feb 27, March 01, 03	❖ Quadratic equations and applications (1.6) ❖ Polynomial and rational inequalities (1.8)	
4 March 06, 08, 10	❖ (continued . . .) Polynomial and rational inequalities (1.8) ❖ Basic Tools; Circles: Cartesian coordinate system, symmetry, distance between two points, circles (2.1)	**Quiz-1**
5 March 13, 15, 17	❖ Straight lines (2.2) ❖ Functions (2.3)	**Assignment 1**
6 March 20, 22, 24	❖ Graphing Functions: Linear and quadratic functions (2.4) ❖ Combining Functions: Operations on functions; composition (2.5)	
7 March 27, 29, 31	❖ Composition of functions (continued…) (2.5) ❖ Inverse functions (2.6)	
8 April 03, 05	❖ Polynomial functions and graphs: polynomial division, synthetic division, division algorithm, remainder theorem (3.1)	**Mid-term Exam**
9 April 12, 14	❖ Factor theorem (3.2) ❖ Partial fractions (3.5)	
10 April 17, 19	❖ Exponential functions (4.1) ❖ The exponential function with base e. (4.2)	
11 April 28	❖ Logarithmic functions (4.3) ❖ Common and natural logarithms (4.4)	
12 May 03, 05	❖ Circular functions (5.2) ❖ Angles and their measure (5.3)	**Quiz-2**

13 May 08, 10, 12	❖ Trigonometric functions (5.4) ❖ Solving right triangles (5.5)	
14 May 15, 17, 19	❖ Basic trigonometric identities and their use (6.1) ❖ Sum, difference and cofunction identities (6.2)	**Assignment 2**
15 May 22, 24, 26	❖ Sum, difference and cofunction identities (…continued) ❖ Double angle and half angle identities (6.3)	
16 May 29, 31, June 02	❖ Double angle and half angle identities (…continued) ❖ Product-sum and sum-product identities (6.4)	
17 June 05, 07, 09	❖ Product-sum and sum-product identities (…continued) ❖ Revision and problems' discussion	**Quiz-3**
June 12 – June 21	Final examination will be conducted as per official schedule. Final examination period is from **June 12 – June 21.**	**Final Exam**