Forman Christian College, Lahore
(A Chartered University)
Fall 2021
Department of Mathematics

Gul E Mehak
(Lecturer, Department of Mathematics)

Email: gulmehak@fccollege.edu.pk
Skype ID: live:gul-e-mehak5202
Office: S-355 (Armacost Science Building)

Office Hours: Monday to Friday: **11:00 am - 12:30 pm**
Online Office Hours: Monday to Friday: **09:00 pm - 10:00 pm**

Course Information:

Course Name: Pre-Calculus and Trigonometry
Course Code: Math 101
Prerequisite: None
Credit Hours: 3
Section: E
Class Timings: Tuesday and Thursday;   09:30 am - 10:45 am
Class Room: S-412

Course Trailer Link: https://www.youtube.com/watch?v=wQXDiQn-0NA&t=7s

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.

Text Book:

- ❖ "PRECALCULUS Functions and Graphs" by Raymond A. Barnett, Michael R. Ziegler, Karl E. Byleen 5th Edition.

Recourses:

- ❖ Course pack (sections from the text book) will be uploaded on Moodle.
- ❖ Recorded video lectures and lecture notes will be uploaded on Moodle every week.

Mode of Instruction:

The mode of teaching will be either full in-person (for all students) or basic blended model (in two groups, even and odd roll numbers), subject to the condition that the government allows universities to have 100% attendance on campus or not.

Blended Mode:–

- ❖ The basic blended model will involve **face to face class sessions** (for on-campus students), and **pre-recorded video lectures** on Moodle (for off-campus students), where students will be switched every week with opposite parity roll number for on-campus and remote learning.
- ❖ **Off-campus students** are expected to watch every video lecture uploaded on Moodle, and to solve related exercises. They can discuss their queries/questions in the **weekly online discussion session on Zoom** and in the given **online office hours**.

Remote:–

- ❖ In case of **fully online teaching**, regular Zoom classes will be conducted along with recorded video lectures and lecture notes uploaded on Moodle.

Note: *Assessments' criteria* will be same for all modes of teaching. Assignments will be conducted on Moodle for every mode. Quizzes, mid-term exam & final exam will be conducted on campus in case of in-person & blended classes. Otherwise for online mode, all assessments will be conducted online on Moodle.

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 on the basis of 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 Requirements: Course assessment will be through **quizzes; attendance, class participation and behavior; assignment; midterm and final exam**.

Attendance, Class Participation and Behavior:-

- ❖ Students are expected to **attend every class** and to arrive at each class on time and remain in class for the entire class period.
- ❖ Student whose attendance is less than 70% will not be allowed to take the final exam.
- ❖ **Mobile Phones will be turned off or on silent mode** while the student is in the classroom. No cell phone calculators are to be used in quizzes, midterm and final exams.
- ❖ Note that there are **5 marks for attendance, class participation and behavior**, which includes attendance during classes and being active in the course by asking questions.
- ❖ 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.
- ❖ Individuals are expected to be aware of what a **constructive educational experience** is and respectful of those participating in a learning environment. Failure to do so can result in disciplinary action up to and including expulsion.
- ❖ For **off-campus students**, online attendance is based on **regularly accessing** the course materials on Moodle, and attending **online discussion Zoom sessions** and submitting tasks on time.

Quizzes, Mid-term and Final Exam:-

- ❖ There is **no make up** for the **missed quizzes**, **midterm exam** and **final exam**.
- ❖ Make up for **midterm and final exam** is possible only under **extremes cases** if a student provides **strong documentary evidence** within **3 days after missing the Midterm/ Final exam**.
- ❖ In case of make-up exam there will be a **0 to 20% deduction in marks** depending upon case-to-case basis.

Assignments:-

- ❖ Assignments will be conducted on Moodle. Students are expected to submit the

assignments within due date and time. Late submission of assignment will result in deduction of marks from the assignment.

❖ Students' assignments should reflect their understanding of content. There is no make up for the missed assignments.
❖ If needed, students may be asked to explain the submitted work.

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.

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 Nov 02, 04	❖ Discussion of course plan and overview of course syllabus ❖ Linear equations and applications (1.1) ❖ System of linear equations and applications (1.2)	

Week	Topics		Assessment
2 Nov 09, 11	❖ Linear inequalities ❖ Absolute value in equations and inequalities	(1.3) (1.4)	
3 Nov 16, 18	❖ Quadratic equations and applications ❖ Polynomial and rational inequalities	(1.6) (1.8)	**Quiz-1** **(Group 1)** Nov 18 (Thurs)
4 Nov 23, 25	❖ Basic Tools; Circles: Cartesian coordinate system, symmetry, distance between two points, circles ❖ Straight lines	(2.1) (2.2)	**Quiz-1** **(Group 2)** Nov 23 (Tues)
5 Nov 30 Dec 02	❖ Functions ❖ Graphing Functions: Linear and quadratic functions	(2.3) (2.4)	**Assignment 1**
6 Dec 07, 09	❖ Combining Functions: Operations on functions; composition ❖ Inverse functions	(2.5) (2.6)	
7 Dec 14, 16	❖ Polynomial functions and graphs: polynomial division, synthetic division, division algorithm, remainder theorem ❖ Factor theorem	(3.1) (3.2)	**MID TERM** **(Group 1)** Dec 16 (Thurs)
8 Dec 21	❖ MIDTERM EXAM		**MID TERM** **(Group 2)** Dec 21 (Tues)
9 Jan 04, 06	❖ Partial fractions ❖ Exponential functions	(3.5) (4.1)	
10 Jan 11, 13	❖ The exponential function with base e. ❖ Logarithmic functions	(4.2) (4.3)	
11 Jan 18, 20	❖ Common and natural logarithms ❖ Circular functions	(4.4) (5.2)	**Quiz-2** **(Group 1)** Jan 20 (Thurs)
12 Jan 25, 27	❖ Angles and their measure ❖ Trigonometric functions	(5.3) (5.4)	**Quiz-2** **(Group 2)** Jan 25 (Tues)
13 Feb 01, 03	❖ Solving right triangles ❖ Basic trigonometric identities and their use	(5.5) (6.1)	**Assignment 2**
14 Feb 08, 10	❖ Sum, difference and cofunction identities ❖ Double angle and half angle identities ❖ Product-sum and sum-product identities	(6.2) (6.3) (6.4)	**Quiz-3** **(Group 1)** Feb 10 (Thurs)

15 Feb 15, 17	❖ Law of sines and cosines (7.1, 7.2) ❖ Revision and problem discussions	**Quiz-3** **(Group 2)** Feb 15 (Tues)
Feb 21 – Mar 02	**Final Exam**	