



Course Title:				<u>Fundamentals of Algebra</u>				
Course Code:				<u>MTL MD201</u>				
Course Instructor:				<u>Dr. Vivek Kumar</u>				
Credits				<u>4</u>				
Evaluation Scheme    Total 100 Marks								
Quiz (Total 20 Marks)				Assignment/Project (Total 20 marks) (Minimum Two Assignments or one Project)		Mid-Term	Major Examination	Total
Quiz I (5 marks)	Quiz II (5 marks)	Quiz III (5 marks)	Quiz IV (5 marks)			20 marks) (1 ½ Hour Duration)	(40 marks) (3 Hour Duration)	100 Marks
WEEKS				TOPICS TO BE COVERED				
Week 1				Introduction of Set Theory, Cartesian Products of Sets, Relations, functions and excercises based on them.				
Week 2				Binary Operations on Sets, Identities, Inverses, and Closure,				
Week 3				Euclidean Algorithm, Divisibility, Primes, GCDs and problems baesd on them.				
Week 4				Congruence, Division Modulo n and Linear Congruence Equations.				
Week 5				Fermat's and Euler's theorems, Matrix Algebra.				
Week 6				Introduction to Groups, Groups of transformations, General and special linear groups.				
Week 7				Dihedral groups, Subgroups, Cyclic Groups, Homomorphisms, Isomorphism.				
Week 8				<b>Mid-Term.</b>				
Week 9				Permutation Groups, The alternating groups $A_n$ , Normal Subgroups, Quotient Groups.				
Week 10				Fundamental Theorem of Group Homomorphism, Coset decomposition,				
Week 11				Lagrange's theorem and its consequences, Cayley's theorem.				
Week 12				Introduction to Rings, Subrings, Integral Domains.				
Week 13				Ideals, Prime and Maximal Ideals, Fields.				
Week 14				Quotient Rings, Finite Fields and excercises based on them.				
Week 15				Fundamental Theorems of Ring Homomorphism.				
Week 16 (8 <sup>th</sup> -12 <sup>th</sup> December, 2025)				<b>Revision Week</b>				
Week 17 (15 <sup>th</sup> – 24 <sup>th</sup> December, 2025)				<b>Major Examinations</b>				
8 <sup>th</sup> January, 2026				<b>Showing of Major Exams Answer Sheets</b>				

After successful completion of this course, students shall be able to:

- CO1.** Study basic concept of Set theory.
- CO2.** Study basic concept of Group theory.
- CO3.** Study basic concept of Ring theory
- CO4.** Apply the above concepts to solve relevant problems of other branches of mathematical science.

**Calendar of Quizzes/Assignment etc. to be provided as per below details and exact dates to be fixed in consultation with other course coordinators to avoid overlap of Quizzes of different courses.**

Component	Date
Quiz-I	22 <sup>th</sup> -26 <sup>h</sup> September, 2025
Quiz-II	6 <sup>th</sup> -9 <sup>th</sup> October, 2025
Assignment-I	27 <sup>th</sup> -31 <sup>th</sup> October, 2025
Mid-Term	13 <sup>th</sup> – 17 <sup>th</sup> October, 2025
Quiz-III	10 <sup>th</sup> – 14 <sup>th</sup> November, 2025
Quiz-IV	24 <sup>th</sup> – 28 <sup>th</sup> November, 2025
Assignment-II	1 <sup>st</sup> – 5 <sup>th</sup> December, 2025
Major Exams	15 <sup>th</sup> – 24 <sup>th</sup> December, 2025

**Note:**

- One surprise Quiz may be fixed out of Quiz-II, Quiz-III or Quiz-IV.
- In case of any deviation in evaluation methodology for courses such as AEC/VAC/SEC shall be mentioned accordingly. Thus, same shall be approved by the next BOS of school if not done earlier.

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**Vivek Kumar**

**Signature of Course Coordinator**