Indraprastha College for Women
University of Delhi

Work Plan for ODD SEMESTER – 2026

Course Name:	B.Sc.(H)
Paper Title:	Algebra
Unique Paper Code:	2352011101
Semester:	I
Faculty:	Dr. Vijay Kumar Tripathi
Year:	2026-27

Work Plan			
Unit No.	Learning Objective	Lecture No.	Topics to be Covered
I	**Theory of Equations**	1	Polynomials
		2	The remainder and factor theorem
		3	Synthetic division
		4	Fundamental theorem of algebra
		5	Relations between the roots and the coefficients of polynomial equations
		6	Relations between the roots and the coefficients of polynomial equations
		7	Upper bounds for the real roots
		8	Results on imaginary roots
		9	Results on integral roots
II		10	Results on rational roots
		11	Newton's method for integral roots
		12	Descartes' rule of signs
	Complex Numbers	13	Polar representation of complex numbers
		14	De-Moivre's theorem for integer and rational indices and their applications

		15	De-Moivre's theorem for integer and rational indices and their applications
III		16	The *n*th roots of unity
		17	Cardan's solution of the cubic equations
		18	Descartes' solution of the quartic equation

Unit	Contents/Syllabus
I	General properties of polynomials and equations, Fundamental theorem of algebra, Relations between the roots and the coefficients, Upper bounds for the real roots; Theorems on imaginary, integral and rational roots; Newton's method for integral roots, Descartes' rule of signs; De-Moivre's theorem for integer and rational indices and their applications, The nth roots of unity, Cardan's solution of the cubic, Descartes' solution of the quartic equation.
II	Division algorithm in , Divisibility and the Euclidean algorithm, Fundamental theorem of arithmetic, Modular arithmetic and basic properties of congruences.
III	Groups, Basic properties, Symmetries of a square, Dihedral group, Order of a group, Order of an element, Subgroups, Center of a group, Centralizer of an element, Cyclic groups and properties, Generators of a cyclic group, Classification of subgroups of cyclic groups.

S. No.	Name of Authors/Books/Publishers
1.	Andreescu, Titu & Andrica, D. (2014). Complex numbers from A to...Z. (2nd ed.). Birkhäuser.
2.	Dickson, Leonard Eugene (2009). First Course in the Theory of Equations. John Wiley & Sons, Inc. The Project Gutenberg eBook: http://www.gutenberg.org/ebooks/29785
3.	Gallian, Joseph. A. (2017). Contemporary Abstract Algebra (9th ed.). Cengage Learning India Private Limited, Delhi. Indian Reprint 2021.
4.	Goodaire, Edgar G., & Parmenter, Michael M. (2006). Discrete Mathematics with Graph Theory (3rd ed.). Pearson Education Pvt. Ltd. Indian Reprint 2018.

	Paper Components		
Credits	**Lecture (L)**	**Tutorial (T)**	**Practical (P)**
	3	**1**	**0**
Assessment Scheme			

S.No.	Component	Marking Scheme	Total Marks
1	Internal Assessment		**30**
	• Assignment	**12**	
	• Class Test	**12**	
	• Attendance	**6**	
2.	Continuous Assessment (**Tutorial**)		40
	• Activity 1	20	
	• Activity 2	15	
	• Attendance	5	
3.	Practical		NA
	• Continuous Assessment		
	• End Term Written/Practical Exam		
	• Viva		
4.	End Semester Examination		90