

UNIVERSITY OF MADRAS
B.Sc. DEGREE PROGRAMME IN MATHEMATICS
SYLLABUS WITH EFFECT FROM 2023-2024

Title of the Course		ABSTRACT ALGEBRA (Common to B.Sc Maths with Computer Applications)					
Paper Number		CORE M9					
Category	Core	Year	III	Credits	4	Course Code	334C5A
		Semester	V				
Instructional Hours per week		Lecture		Tutorial		Lab Practice	Total
		4		1		--	5
Pre-requisite		12 th Standard Mathematics					
Objectives of the Course		<ul style="list-style-type: none"> • Concepts of Sets, Groups and Rings. • Construction, characteristics and applications of the abstract algebraic structures 					
Course Outline		UNIT-I: Introduction to groups- Subgroups- cyclic groups - Lagrange's Theorem-A counting principle –Examples. Chapter 2 : Sections: 2.4 and 2.5. Hours:15					
		UNIT-II: Normal subgroups and Quotient group- Homomorphism- Automorphism -Examples. Chapter 2: Sections: 2.6 – 2.8 Hours:15					
		UNIT-III: Cayley's Theorem-Permutation groups - Examples Chapter 2 : Sections: 2.9 and 2.10. Hours:15					
		UNIT-IV: Definition and examples of ring- Some special classes of rings- homomorphism of rings- Ideals and quotient rings- More ideals and quotient rings. Chapter 3 : Sections 3.1 – 3.5 Hours:15					
		UNIT-V: The field of quotients of an integral domain-Euclidean Rings The particular Euclidean Ring – Examples. Chapter 3 : Sections: 3.6 – 3.8 Hours:15					
Extended Professional Component (is a part of internal component only, Not to be included in the External Examination question paper)		Total Hours: 75					
Skills acquired from this course		Questions related to the above topics, from various competitive examinations UPSC / TNPSC / others to be solved (To be discussed during the Tutorial hour)					
Recommended Text		Topics in Algebra–I.N.Herstein, Wiley Eastern Ltd. Second Edition (1 st January 2006)					

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Reference Books	1. A First Course in Abstract Algebra, John B. Fraleigh, 7th Ed., Pearson, 2002. 2. Abstract Algebra, M. Artin, 2nd Ed., Pearson, 2011. 3. Contemporary Abstract Algebra, Joseph A Gallian, 4th Ed., Narosa, 1999.
Website and e-Learning Source	https://nptel.ac.in https://www.mathhelp.com/

Course Learning Outcome (for Mapping with POs and PSOs)

Students will be able to

CLO 1: Explain groups, subgroups and cyclic groups

CLO 2: Explain about Normal subgroup, Quotient groups, Homomorphisms and Automorphisms and verify the functions for homomorphism and automorphism properties

CLO 3: Explain Permutation groups and apply Cayley's theorem to problems

CLO 4: Explain Rings, Ideals and Quotient Rings and examine their structure

CLO 5: Discuss about the field of quotient of an integral domain and to Explain in detail about Euclidean Rings

	POs						PSOs		
	1	2	3	4	5	6	1	2	3
CLO 1	3	3	2	3	1	-	3	3	1
CLO 2	3	3	2	3	1	-	3	3	1
CLO 3	3	3	2	3	2	-	3	3	1
CLO 4	3	3	2	3	1	-	3	3	1
CLO 5	3	3	2	3	2	-	3	3	1