

I.G. GOVT. P.G. COLLEGE, TOHANA
LESSON PLAN OF MATHEMATICS DEPARTMENT SESSION 2025-26(ODD SEM)
 Class: BA/B.Sc. (N.M.) Sem-5th Paper: GROUP AND RINGS
 Subject: Mathematics

Period	Topics to be covered	Topic of Assignments / MTE to be given to the students	
24 th July to 10 th August 2025.	Definition of a group with example and simple properties of groups, Subgroups and Subgroup criteria, Generation of groups, cyclic groups.	Assignment - 1	Mid term Exam
11 th August to 25 th August 2025	Cosets, Left and right cosets, Index of a sub-group Coset decomposition, Lagrange's theorem and its consequences, Normal subgroups, Quotient groups.		
26 th August to 10 th Sept 2025	Homomorphisms, isomorphisms, automorphisms and inner automorphisms of a group. Automorphisms of cyclic groups		
11 th Sept to 25 th Sept 2025	Permutations groups. Even and odd permutations. Alternating groups, Cayley's theorem, Centre of a group and derived group of a group.		
26 th Sept to 10 th Oct 2025	Introduction to rings, subrings, integral domains and fields, Characteristics of a ring. Ring homomorphisms, ideals (principle, prime and Maximal)		
11 th Oct to 25 th Oct 2025	Quotient rings. Field of quotients of an integral domain		
4 th Nov to 15 th Nov 2025	Euclidean rings, Polynomial rings, Polynomials over the rational field. The Eisenstein's criterion.		
16 th Nov to 24 th Nov 2025	Polynomial rings over commutative rings, Unique factorization domain, R unique factorization domain implies so is $R[X_1, X_2, \dots, X_n]$	Assignment - 2	

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LESSON PLAN OF MATHEMATICS DEPARTMENT SESSION 2025-26(ODD SEM)

Class: MSC Mathematics Sem-III

Paper: Topology

Subject: Mathematics

Period	Topics to be covered	Topic of Assignments / MTE to be given to the students	
24 th July to 10 th August 2025.	Definition and examples of topological spaces, Neighborhoods, closed sets, closure, Interior, exterior and boundary of a set, Adherent points and Accumulation points, closure of a set as a set of adherent points, derived Base and sub-base for a topology, Neighbourhood system of a point and its properties.	Assignment	Mid- Term Exam
11 th August to 25 th August 2025	Base for a neighbourhood system, Subspaces and relative topology. First countable, second countable and separable spaces, their relationships and hereditary properties, about countability of a collection of disjoint open sets in a separable and second countable space. Lindelof's theorems. sets, properties of closure operator, dense subsets.		
26 th August to 10 th Sept 2025	Comparison of topologies on a set, about intersection, union, infimum and supremum of a collection of topologies on a set, Definition, examples and characterizations of continuous functions, composition of continuous functions, open and closed functions, homeomorphism.		
11 th Sept to 25 th Sept 2025	Separation axioms, T_0 , T_1 , T_2 , Regular, T_3 spaces, their characterization and hereditary properties, productive properties of T_1 and T_2 spaces, completely regular and Tychonoff spaces, their hereditary and productive properties.		
26 th Sept to 10 th Oct 2025	Normal and T_4 spaces, normality of a regular Lindelof space, Urysohn's lemma, complete regularity of a regular normal space, T_a implies Tychonoff, Tietze's extension theorem.		
11 th Oct to 25 th Oct 2025	Connected spaces, separation of a topological space, definition of connectedness in terms of separation, characterization of connectedness,		

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4 th Nov to 15 th Nov 2025	connected subsets and their properties. continuity and connectedness, connectedness and product spaces. Compactness: definition and examples of compact spaces and subsets, compactness in terms of finite intersection property,		
16 th Nov to 24 th Nov 2025	continuity and compact sets, compactness and separation properties, closedness of compact subset and a continuous map from a compact space into a Hausdorff and its consequence, regularity and normality of a compact Hausdorff space		


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LESSON PLAN OF MATHEMATICS DEPARTMENT SESSION 2025-26(ODD SEM)

Class: MSC Mathematics Sem-I

Paper: Abstract Algebra

Subject: Mathematics

Period	Topics to be covered	Topic of Assignment / MTE to be given to the students	
24 th July to 10 th August 2025.	Automorphisms and Inner automorphisms of a group G. The groups $\text{Aut}(G)$ and $\text{Inn}(G)$. Automorphism group of a cyclic group. Normalizer and Centralizer of a non-empty subset of a group G. Conjugate elements and conjugacy classes. Class equation of a finite group G and its applications. Derived group (or a commutator subgroup) of a group G. perfect groups. Simplicity of the Alternating group A_n ($n \geq 5$).	Assignment	Mid -Term Exam
11 th August to 25 th August 2025	Zassenhaus's Lemma. Normal series and Composition series of a group G. Scheier's refinement theorem. Jordan Holder theorem. Composition series of groups of order p^n and of finite Abelian groups. Cauchy's theorem for finite groups p- groups and for finite abelian groups. Sylow p-subgroups. Sylow's 1st, 2nd and 3rd theorems. Application of Sylow theorems.		
26 th August to 10 th Sept 2025	Commutators identities. Commutator subgroups. Three subgroups Lemma of P.Hall. Central series of a group G. Nilpotent groups. Centre of a nilpotent group. Subgroups and factor subgroups of nilpotent groups.		
11 th Sept to 25 th Sept 2025	Finite nilpotent groups. Upper and lower central series of a group G and their properties. Subgroups of finitely generated nilpotent groups. Sylow-subgroups of nilpotent groups Solvable groups. Derived series of a group G.		
26 th Sept to 10 th Oct 2025	Modules, submodules and quotient modules. Module generated by a non-empty subset of an R-module. Finitely generated modules and cyclic modules. Idempotents. Homomorphism of R-modules. Fundamental theorem of homomorphism of R-modules.		
11 th Oct to 25 th Oct 2025	Noetherian modules and Noetherian rings. Endomorphism ring of a finite direct sum of modules. Finitely generated modules. Ascending and descending chains of sub modules of an R-module.		

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4 th Nov to 15 th Nov 2025	Ascending and Descending chain conditions (A.C.C. and D.C.C.). Finitely co-generated modules. Artinian modules and Artinian rings. Nilpotent elements of a ring R. Nil and nilpotent ideals.		
16 th Nov to 24 th Nov 2025	Hilbert Basis Theorem. Structure theorem for finite Boolean rings. Wedderburn-Artin theorem and its consequences. Uniform modules. Primary modules.		

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LESSON PLAN OF MATHEMATICS DEPARTMENT SESSION 2025-26(ODD SEM)

Class: BA Sem-III

Paper: Quantitative Aptitude

(SEC)

Subject: Mathematics

Period	Topics to be covered	Topic of Assignments / MTE to be given to the students	
24 th July to 10 th August 2025.	Linear Equations, Quadratic equations, System of algebraic equations in two variables and their applications in simple problems.	Assignment	Mid- Term Exam
11 th August to 25 th August 2025	Problems on ages, Clocks, Time and distance: Problems based on trains, Boats and Streams, Pipes and Cistern.		
26 th August to 10 th Sept 2025	Work and time: Problems on work and time, Work and wages..Simple interest, Compound Interest, Partnership.		
11 th Sept to 25 th Sept 2025	Basic idea of set theory to solve practical problems. .		
26 th Sept to 10 th Oct 2025	Trigonometric ratios and identities, Height and distance.		
11 th Oct to 25 th Oct 2025	Basic idea of Permutations and Combinations.		
4 th Nov to 15 th Nov 2025	Events and sample space, Probability. .		
16 th Nov to 24 th Nov 2025	Data interpretation: Raw and grouped data, Bar Graph, Pie Chart, Mean, Median and Mode.		


Asst. Prof. Mathy