

Lecture Plan		
Name of the College: Government College of Arts, Science and Commerce, Sanquelim-Goa		
Name of Faculty: Vishal Vinayak Gawas	Subject: Mathematics	
Paper code: MAT-100- Foundational Mathematics	Program: B.Sc.	Division: -
Academic year: 2025-26	Semester: I	Total Lectures: 45
Course Objectives: To develop logical reasoning among students in order to be able to organize all aspects of mathematics in such a way that at the base are the most fundamental concepts, assumptions and principles, and the other aspects depend on this base		
Expected Course Outcome: 1) Infer the truth of various sentences and its equivalents and outline various properties of sets. 2) Examine and identify the types of relations and functions. 3) Make use of the strong and weak induction 4) Solve system of linear equations. 5) Discuss the properties of determinants.		
Student Learning Outcome: Student will be able to 1) Recollect the basic definitions and theorems in foundations and explain the various proofs and concepts involved. 2) Apply the concepts of linear equations and determinants to explain proofs and solve problems effectively.		

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
June	20/06/2025	21/06/2025	1	Statements; Statements with quantifiers; Compound statements; Implications; Proofs in Mathematics.			Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	23/06/2025	28/06/2025	3	Identifying and using quantifiers, negating statements with single and multiple quantifiers, compound statements with quantifiers, conjunction and disjunction of statements, and negation of a compound statements of a compound statement. Different forms of implications, converse of implications, negating implications, and contrapositive of implications.		Smart Board PDF	Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	30/06/2025	05/07/2025	3	Different types of proofs in mathematics. Sets: Basic Terminologies; Operations on sets; Family of sets; Power sets; Cartesian product of sets		Smart Board PDF	Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.

	07/07/2025	12/07/2025	3	Functions: Basic definitions: One-One, Onto functions and Bijections; Composition of functions			Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	14/07/2025	19/07/2025	3	Functions: Basic definitions: One-One, Onto functions and Bijections; Composition of functions		Data projector	Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	21/07/2025	26/07/2025	3	Functions: Inverse of a function; Image of subsets under functions;			Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i>, Narosa Publishers, 2018.
July August	28/07/2025	02/08/2025	3	Functions: Inverse image of subsets under functions.			Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
August	04/08/2025	09/08/2025	3	Relations: Relation on sets; Types of relations;		Smart Board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in</i>

						<i>Mathematics</i> , Narosa Publishers, 2018.
	11/08/2025	16/08/2025		Relations:Equivalence relations; Equivalence classes and partitions of sets.		Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	18/08/2025	23/08/2025	3	Induction Principles: The Induction Principle; The Strong Induction Principle;	Smart Board PDF	Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	25/08/2025	30/08/2025	0 Chaturthi Break 26/08/25 To 01/09/25			Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
September	02/09/2025	06/09/2025	3	Induction Principles:The Well – Ordering Principle; Equivalence of the three principles.	Smart Board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.

	08/09/2025	13/09/2025	3	System of Linear Equations: Solutions & Elementary Operations: Linear system of equations and their solutions; Equivalence of two systems; Elementary operations on equations; elementary row operations.			Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	15/09/2025	20/09/2025	3	System of Linear Equations: Gaussian Elimination: Row reduced echelon forms; Gaussian algorithm;		Smart Board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	22/09/2025	27/09/2025	3	System of Linear Equations: Rank. Homogeneous Equations: Sufficient condition for the existence of a non-trivial solution.		Smart Board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
September October	29/09/2025	04/10/2025	3 Gandhi Jayanti / Dussehra	Determinants: The Laplace Expansion: Determinants and their properties. Determinant & Matrix inverses: Product theorem and other related theorems (Statements of these theorems only. However, the idea of the proof, though not a part of the syllabus, is encouraged)			Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.

October	06/10/2025	11/10/2025	3	Determinants:Adjoint formula for A^{-1} ; Cramer's rule			Ajit Kumar, S. Kumaresan, and B. K. Sarma: <i>A Foundation Course in Mathematics</i> , Narosa Publishers, 2018.
	13/10/2025	18/10/2025	3	Revision			

*** Assessment Rubrics**

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
Practical	Nil
Project	Nil
Semester End Exam	60