Lecture Plan

Name of the College: Government College of Arts, Science and Commerce, Sanquelim-Goa

Name of Faculty: Amit Harichandra Thakur | **Subject:** Mathematics

Paper code: MAT-100 Foundational Mathematics | **Program: F.Y.B**.Sc. | **Division: -**

Academic year: 2024-25 | **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:
The student will be able to,
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 systems of linear equations.
5) Discuss the properties of determinants.

Student Learning Outcome: Student will be able to
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

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
July	01/07/2024	06/07/2024	3	Statements; Statements with quantifiers; Compound statements; Implications; Proofs in Mathematics.		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: A Foundation Course in Mathematics, Narosa Publishers, 2018
	08/07/2024	13/07/2024	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 statement		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: A Foundation Course in Mathematics, Narosa Publishers, 2018
	15/07/2024	20/07/2024	3	Sets (basic terminologies) Operations on set		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: A

						Foundation Course in Mathematics, Narosa Publishers, 2018
	22/07/2024	27/07/2024	3	Family of Sets, Power sets , Cartesian product of sets.		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: *A Foundation Course in Mathematics*, Narosa Publishers, 2018
July August	29/07/2024	03/08/2024	3	Relation on sets; Types of relations; Equivalence relations		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: *A Foundation Course in Mathematics*, Narosa Publishers, 2018
August	05/08/2024	10/08/2024	3	Equivalence classes and partitions of sets.		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: *A Foundation Course in Mathematics*,

						Narosa Publishers, 2018
	12/08/2024	17/08/2024	2	Functions: Basic definitions: One-One function, onto functions.		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: *A Foundation Course in Mathematics*, Narosa Publishers, 2018
	19/08/2024	24/08/2024	3	Bijections; Composition of functions		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: *A Foundation Course in Mathematics*, Narosa Publishers, 2018
	26/08/2024	31/08/2024	3	Inverse of a function		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: *A Foundation Course in Mathematics*, Narosa

Month							
							Publishers, 2018
September	02/09/2024	07/09/2024	3	Image of subsets under functions; Inverse image of subsets under functions.		Chalk board	Ajit Kumar, S. Kumaresan, and B. K. Sarma: A Foundation Course in Mathematics, Narosa Publishers, 2018
	09/09/2024	14/09/2024	1	: Linear system of equations and their solutions;		Chalk board	W. K. Nicholson: Linear Algebra with Applications, 4th Edition, McGraw – Hill Ryerson Limited, 2003.
	16/09/2024	21/09/2024	3	Solving system of linear equations using elementary operations Gaussian Elimination: Row reduced echelon forms; Gaussian algorithm; Rank.		Chalk board	W. K. Nicholson: *Linear Algebra with Applications,* 4 Edition, McGraw – Hill Ryerson Limited, 2003.
	23/09/2024	28/09/2024	3	Homogeneous Equations: Sufficient condition for the existence of a non-trivial solution. Solving homogeneous system of equations		Chalk board	W. K. Nicholson: *Linear Algebra with Applications,* 4 Edition, McGraw

							– Hill Ryerson Limited, 2003.
Septem ber October	30/09/2024	05/10/2024	3	The Laplace Expansion: Determinants and their properties. Determinant & Matrix inverses		Chalk board	W. K. Nicholson: *Linear Algebra with Applications,* 4 E dition, McGraw – Hill Ryerson Limited, 2003.
October	07/10/2024	12/10/2024	3	Product theorem and other related theorems Computing determinants using the properties of determinants		Chalk board	W. K. Nicholson: *Linear Algebra with Applications,* 4 E dition, McGraw – Hill Ryerson Limited, 2003.
	14/10/2024	19/10/2024	3	Adjoint formula for $A-1$; Cramer's rule.		Chalk board	W. K. Nicholson: *Linear Algebra with Applications,* 4 E dition, McGraw – Hill Ryerson Limited, 2003.
	21/10/2024	23/10/2024	3	Revision		Chalk board	

* Assessment Rubrics

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
Semester End Exam	60