Lecture Plan

Name of the college: Government College of Arts , Science & Commerce, Sanquelim, Goa.

Name of Faculty: Prajyot Maruti Patil	**Subject:** Number Theory	
Paper code: MAT-5206	**Program: M.Sc.**	**Division:**
Academic year: 2025-26	**Semester: II**	**Total Lectures: 30**

Course Objectives:

1. **At the end of this course the student will gain basic knowledge of primitive roots, quadratic reciprocity and continued fractions.**

Expected Course Outcome:

1) **Display Understanding and knowledge of Primitive Roots, Quadratic Congruences and continued fractions.**
2) **Prove important theorems in Number Theory.**
3) **Apply knowledge of congruence and Primitive Roots to solve competitive exam problems.**
4) **Create appropriate arguments to justify the proofs.**

Student Learning Outcome:

1. Display Understanding and knowledge of Primitive Roots, Quadratic Congruences and continued fractions.
2. Apply knowledge of congruence and Primitive Roots to solve competitive exam problems.

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
December	01/12/2025	06/12/2025	St. Francis Xaviers Feast 01	The order of an integer modulo n, Primitive Roots for Primes		Smart Board	David M. Burton, Elementary Number Theory
December	08/12/2025	13/12/2025	02	Composite numbers having primitive roots, The theory of indices		Smart Board PDF	David M. Burton, Elementary Number Theory
December	15/12/2025	20/12/2025	Liberation Day 01	Euler's criterion, the Legendre symbol			David M. Burton, Elementary Number Theory
December	22/12/2025	23/12/2025	02	Quadratic reciprocity		Data projector	David M. Burton, Elementary Number Theory
January	02/01/2026	03/01/2026	02	Quadratic congruences with composite moduli			David M. Burton, Elementary Number Theory
January	05/01/2026	10/01/2026	02	Marine Mersenne, Perfect Numbers			David M. Burton, Elementary Number Theory
January	12/01/2026	17/01/2026	02	Mersenne primes and amicable numbers, Fermat Numbers		Smart Board	David M. Burton, Elementary Number Theory
	19/01/2026	24/01/2026	02	Sums of two squares			David M. Burton, Elementary Number Theory
January	26/01/2026	31/01/2026	01	Sums of more		Smart Board	David M. Burton,

			Republic Holiday	than two squares		PDF	Elementary Number Theory
February	02/02/2026	07/02/2026	02	Sums of more than two squares			David M. Burton, Elementary Number Theory
February	09/02/2026	14/02/2026	02	Finite continued fractions		Smart Board	David M. Burton, Elementary Number Theory
February	16/02/2026	21/02/2026	02	Finite continued fractions			David M. Burton, Elementary Number Theory
February	23/02/2026	28/02/2026	02	Infinite continued fractions		Smart Board	David M. Burton, Elementary Number Theory
March	02/03/2026	07/03/2026	01 Holi			Smart Board	
March	09/03/2026	14/03/2026	02	Farey fractions			David M. Burton, Elementary Number Theory
March	16/03/2026	21/03/2026	01 Gudi Padva / Id-Ul Fitr	Farey fractions			David M. Burton, Elementary Number Theory
March	23/03/2026	28/03/2026	01 Ram Navami	Pell's equation		Smart Board	David M. Burton, Elementary Number Theory
March-April	30/03/2026	04/04/2026	02	Revision			

*** Assessment Rubrics**

Component	Max Marks
ISA 1	7.5
Mid Term Exam	15
ISA 2	7.5
Practical	Nil
Project	Nil
Semester End Exam	20