



MAT 626 – Number Theory

Course Code & Number	Course Name	Credit Hours	Lec.	Lab.	Tut.	Prerequisites
MAT 626	Number Theory	4	3	0	1	

Syllabus:

Linear and Quadratic Equations: Review of Congruencies Arithmetic, the linear congruence equation, The public-key coding system, Quadratic residues, Legendre symbol and its properties, Gauss lemma, Quadratic Reciprocity Law, Jacobi symbol, Worked examples and math software applications.

Quadratic forms: Definitions and basic properties, Equivalence of quadratic forms, Reduced quadratic forms, Quadratic representation, two squares sum representation, Sums of four squares sum representation and Lagrange's Theorem .

Continued Fractions: Definitions and basic properties,, Characterizing rationales by finite continued fractions, Finding a particular solution of the linear congruence equation, Continued fractions approximation of a real number, Purely periodic continued fraction, Pell's Equations.

References

1. A. Baker; *A Comprehensive Course in Number Theory*; Cambridge Univ. Press. 2012. **(Main Reference)**
2. I. Niven, H. Zuckerman and H. Montgomery; *An Introduction to the Theory of Numbers*; 5th Edition, Wiley, 1991.
3. C. Olds; *Continued Fractions*; Mathematical Association of America (MAA), 1992.

