Code	Subject Title	Cr. Hrs	Semester
MATH-424	**Number Theory - II**	**3**	**VIII**
Year	Discipline		
4	**Mathematics**		

Objectives:

Quadratic Residues

- Composite moduli, Legendre symbol
- Law of quadratic reciprocity
- The Jacobi symbol
- Diophantine Equations
- Equations and Fermat's conjecture for n = 2, n = 4

Algebraic Number Theory

- Polynomials over a field
- Divisibility properties of polynomials
- Gauss's lemma
- The Einstein irreducibility criterion
- Symmetric polynomials
- Extensions of a field
- Algebraic and transcendental numbers
- Bases and finite extensions, properties of finite extensions
- Conjugates and discriminants
- Algebraic integers in a quadratic field, integral bases
- Units and primes in a quadratic field
- Ideals, arithmetic of ideals in an algebraic number field
- The norm of an ideal, prime ideals, units of algebraic number field

Recommended Books:

- W. J. Leveque, Topics in Number Theory, Vols. I and II (Addison-Wesley Publishing Co. Publishing Co., 1956)
- Tom M. Apostol, Introduction to Analytic Number Theory, (Springer International, 1998) 50
- David M. Burton, Elementary Number Theory, 6th edition, (McGraw Hill Company, 2007)
- A. Andrew, The Theory of Numbers, (Jones and Barlett Publishers London, 1995)
- Harry Pollard, The Theory of Algebraic Numbers , (John Wiley and Sons, 1950)