**COURSE (LESSON) PLAN EVEN SEMESTER (2018-19)**

Subject: **NUMBER THEORY AND ALGEBRAIC STRUCTURES**

SUBJECT CODE: **MATH 2201**

**Module I. Number Theory**

Lecture 1: Basic introduction to number theory. Statement and application of Well-Ordering principle.

Lecture 2: Statement and proof of Division Algorithm.

Lecture 3: Definition of divisibility, greatest common divisor and least common multiple. Explanation of properties and problems.

Lecture 4: Discussion of Euclidean algorithm with problems.

Lecture 5: Discussion of linear Diophantine equations with examples.

Lecture 6: Definition of prime numbers. Euclid Theorem. Test of primality.

Lecture 7: Definition of Congruence with properties and problems. Residue class of integer modulo n.

Lecture 8: Definition and problems on linear congruence.

Lecture 9: Chinese Remainder Theorem. Fermat’s Theorem. Applications.

Lecture 10: Idea of Poset, lattice, Hasse diagram.

Lecture 11: Lattices and its properties, Principle of Duality, Distributive and Complemented Lattices.

Lecture 12: Problems of poset and lattice.

**Module IV – Morphisms, Ring and Field.**

Lecture 1: Homomorphisms and isomorphisms of groups.

Lecture 2: Discussion of basic theorems on homomorphisms and isomorphisms of groups.

Lecture 3: Discussion of problems involving homomorphisms and isomorphisms. Revision.

Lecture 4: Rings. Some elementary properties of a ring. Ring with unity. Examples.

Lecture 5: Ring with unity. Characteristic of a ring. Ring with zero divisors. Examples.

Lecture 6: Discussion of problems involving rings.

Lecture 7: Subring. Integral Domain. Examples.

Lecture 8: Discussion of problems involving subrings. Division rings and skew fields.

Lecture 9: Discussion of problems involving integral domains.

Lecture 10: Fields. Examples.

Lecture 11: Discussion of problems involving fields.

Lecture 12: Overall discussion of abstract algebra problems on the whole module.