

Department of Mathematics and Computer Science

Friday, December 6, 2019, 4:10 pm

Master's Thesis Defense
Mohsin Md Abdul Karim
Old Main 2210

Hidden Symmetries in Classical Mechanics and Related
Number Theory Dynamical Systems

Abstract:

Classical mechanics consists of three parts: *Newtonian*, *Lagrangian*, and *Hamiltonian Mechanics*. Each part has explicit symmetries (the explicit Laws of Motion), which in turn generate implicit, or hidden symmetries (like the Law of Conservation of Energy, etc.).

In the Master Thesis defense, different types hidden symmetries will be considered. They are reflected in the **Noether Theorem** and the **Poincare Recurrence Theorem**, respectively. The Poincare Recurrence Theorem is also applicable to some number theory problems, which can be considered as dynamical systems. The problem **“The first digits of the powers of integers”** will be considered in the talk, and some hidden symmetries, like *circle and tori rotations*, as well as *hidden arithmetic progressions* in the set of all the exponents, will be established.