

Course Title: Topics in Algebraic Number Theory  
Course #: MATH 87000  
Day(s), Time & Location: Th, 2:00 pm- 4:00 pm  
Instructor Name: Victor Kolyvagin  
Contact Information: VKolyvagin@gc.cuny.edu  
Pre-Requisites: \_\_\_\_\_  
Office Hours: Th, 1:00 pm- 2:00 pm

Description:       The course will introduce beginnings of Euler Systems method for bounding Selmer-type groups, with applications to arithmetic of elliptic curves.  
                          Main topics will include:  
                          Elliptic curves, their Mordell-Weil, Shafarevich-Tate and Selmer groups. Modular parametrization and L-functions. Galois representation on torsion points of an elliptic curve, CM case, not CM case. Elements of class field theory and theory of complex multiplication. Ring class fields. Heegner points over ring class fields. Special Galois cohomology classes, reciprocity law, bounding of Selmer groups. Applications to the study of Mordell-Weil and Shafarevich-Tate groups. Gross-Zagier formula, applications to the Birch-Swinnerton-Dyer conjecture.  
                          There is no particular text book to be used.