

Proposal for a Special Topics Course, Fall 2007, Klaus Lux.

Topic: Homological Algebra

Instructor: Klaus Lux.

Course material: P.J. Hilton and U. Stammbach, A Course in Homological Algebra, Graduate Texts in Mathematics 4, Springer, 2nd edition.

Prerequisites: the graduate Algebra core course.

Description of the course: We will give an introduction to the methods of Homological Algebra. Homological Algebra originated from Algebraic Topology and is now widely used in quite diverse areas of modern mathematics such as Group theory, Number theory, the theory of Lie algebras and differential geometry. We will start with a discussion of underlying language of categories and functors and notions such as exact sequences and derived functors. We will then move on to investigate the fundamental properties of Homological Algebra using this language. In the second part of the course, we will focus on applications in Group theory, Number theory, and the theory of Lie-algebras.