Graduate Student Seminar

The Role of the Jacobson Radical of the Endomorphism Ring in the Baer-Kaplansky Theorem

Speaker: Mary Flagg

Date: Friday, 3rd March, 2006

Time: 2:00-3:00 p.m.
Place: Room 347 PGH

Abstract

The celebrated theorem by Baer and Kaplansky states that two torsion groups are isomorphic if their endomorphism rings are isomorphic rings. Analogous theorems have been proven for torsion-free and certain classes of mixed modules over a complete discrete valuation domain. The main tool employed in these isomorphism theorems is the use of the idempotent projections to identifiable direct summands.

The question under study is the extent to which the idempotents are necessary for the isomorphism theorems. The Jacobson radical of the endomorphism ring is an ideal of the ring that contains none of the nonzero idempotents. Yet Hausen, Praeger and Schultz proved that for torsion groups which are unbounded modulo their maximal divisible subgroup, two groups are isomorphic if only the Jacobson radicals of their endomorphism rings are isomorphic rings.

We extend this result to modules over complete discrete valuation domains. Isomorphism theorems will be presented for torsion free modules, torsion modules with an unbounded basic submodule and for certain classes of mixed modules of torsion-free rank one.