

Set Theoretical Aspects of Covers & Envelopes of Modules and Construction

Lecture I. Set theoretical aspects of covers and envelopes of modules

Abstract: We will introduce the notion of covers and envelopes of modules and prove their main basic properties. We will discuss the existence of these covers and why it relies on set-theoretical aspects of module theory.

Lecture II. On the construction of indecomposable envelopes

Abstract. We will prove that cotorsion modules (that is, injective objects in the category of flat modules) can be described in terms of a set of indecomposable objects. This result suggests that it is possible to define a notion of spectrum in this category. We will also apply our results to the study of the cotorsion envelope of the ring. In particular, we will show that many of the known characterizations of semilocal rings can be explained in this way.