Rings and Modules
Anelli e Moduli

For students of the Master's degree in Mathematics (Laurea Magistrale) and students of the Master Mundus ALGANT program.

Spring term: April 11 – June 17, 2011
Total number of hours: 48 (6 credits).
Examination: oral.

Description of the course

This is a second course in Modules over arbitrary Rings and in Abelian Categories. A particular emphasis will be given to Grothendieck Categories and to derived functors, introducing the homologial algebra associated to them.

Program

Grothendieck Categories
The Gabriel-Popescu Theorem and applications
Chain Complexes and Homotopies
δ-functors
Left and right derived functors
Tor and Ext for module categories
Derived functors and the inverse limits
Homological dimension

References

- B. B. Stenström, Rings of quotients, Grundleheren der Math., 217, Springer-Verlag, 1975.

- D.W. Anderson, K.R. Fuller, Rings and Categories of Modules, GTM 13, Springer Verlag, New York, 1992.

- J. Rotman, An introduction to Homological Algebra, Second edition. Universitext. Springer, New York, 2009.

- C.A. Weibel, An introduction to Homological Algebra, Cambridge studies in advanced mathematics, 38, Cambridge University Press, 1994.