Homology Theory (9 ECTS)

Christian Ausoni (Université Paris 13)

1er semestre

Program

In this lecture course, we will begin by introducing basic category theory, chain complexes and elementary homological algebra, including resolutions and the derived functors Tor and Ext.

We will then define and study the signular homology and cohomology of spaces, review the Eilenberg-Steenrod axioms, as well as the Kunneth and universal coefficient theorems. The end of the lecture will be dedicated to the cup product and Poincaré duality.

References

[Hat02] A. Hatcher, ***Algebraic Topology***, Cambridge University Press, Cambridge, 2002.

[M92] J. P. May, ***A concise course in algebraic topology***, Chicago Lectures in Maths, University of Chicago Press, 1992.

[ML95] S. Mac Lane, ***Homology***, Classics in Mathematics, reprint of the 1975 edition, Springer, 1995.

[ML98] S. Mac Lane, ***Categories or the working mathematician***, Second edition. Graduate Texts in Mathematics, 5, Springer, 1998.

[tD08] T. tom Dieck, ***Algebraic Topology***, EMS Textbook in Mathematics, 2008.

[Wei94] Ch. Weibel, ***An introduction to homological algebra***, Cambridge Studies in Advanced Mathematics, 38, Cambridge University Press, Cambridge, 1994.