UCLouvain

lmat2215

2020

Homological algebra

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

5 credits	30.0 h + 15.0 h	Q1

This biannual learning is being organized in 2020-2021

Teacher(s)	Van der Linden Tim ;
Language :	English
Place of the course	Louvain-la-Neuve
Aims	*The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Part of the final mark will take into account continuous evaluation throughout the course. This part of the mark will serve for each exam session and cannot be represented. There will also be an oral exam (exercises, 40% and theory, 60%). At the exam, we test knowledge and understanding of the notions and fundamental results of the course, as well as mastery of the basic techniques of homological algebra.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The learning activities consist of lectures and practical work sessions. Lectures aim to introduce fundamental concepts, motivate them by showing examples and establishing results. The results are often presented with historical comments and applications. The practical work sessions aim to assimilate the theory through calculation exercises and reflection exercises.
Content	The aim of this activity is to expose the fundamental concepts of homological algebra. The following subjects will be treated within the framework of this course: 1. Categories of modules 2. Projective and injective modules 3. Chain complexes 4. Homology of a complex 5. Singular homology of a topological space 6. Morphisms of complexes and homotopies between them 7. Simplicial objects and the Dold-Kan theorem 8. Abelian categories: examples and basic properties 9. Homological lemmas in abelian categories
Inline resources	Course webpage on Moodle, where also the latest version of the course notes is available
Bibliography	S. Mac Lane, Homology, Springer, 1967. Ch. A. Weibel, An introduction to homological algebra, Cambridge University Press, 1994.
Faculty or entity in charge	MATH

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Mathematics	MATH2M	5		
Master [60] in Mathematics	MATH2M1	5		