Higher Algebra and Formalised Mathematics

## Advanced Mathematics second year program 2024–2025

http://mathematiques.ens-lyon.fr/medias/fichier/algebra-formalisation_1702642869328-pdf?ID_FICHE=230253&INLINE=FALSE

Presentation of the program

Higher algebra, categorification in algebra and geometry, rewriting theory, type theory in computer science and mathematics and formalisation of mathematics have led to recent developments of original and interesting mathematics. This program aims to present a flavour of all these new approaches according to three axes:
1/ categorification and algebraic rewriting,
2/ type theory,
3/ formalised mathematics using proof assistants.

The objective is also to prepare students for research in these three very active areas of mathematics at the interplay with fundamental computer science.
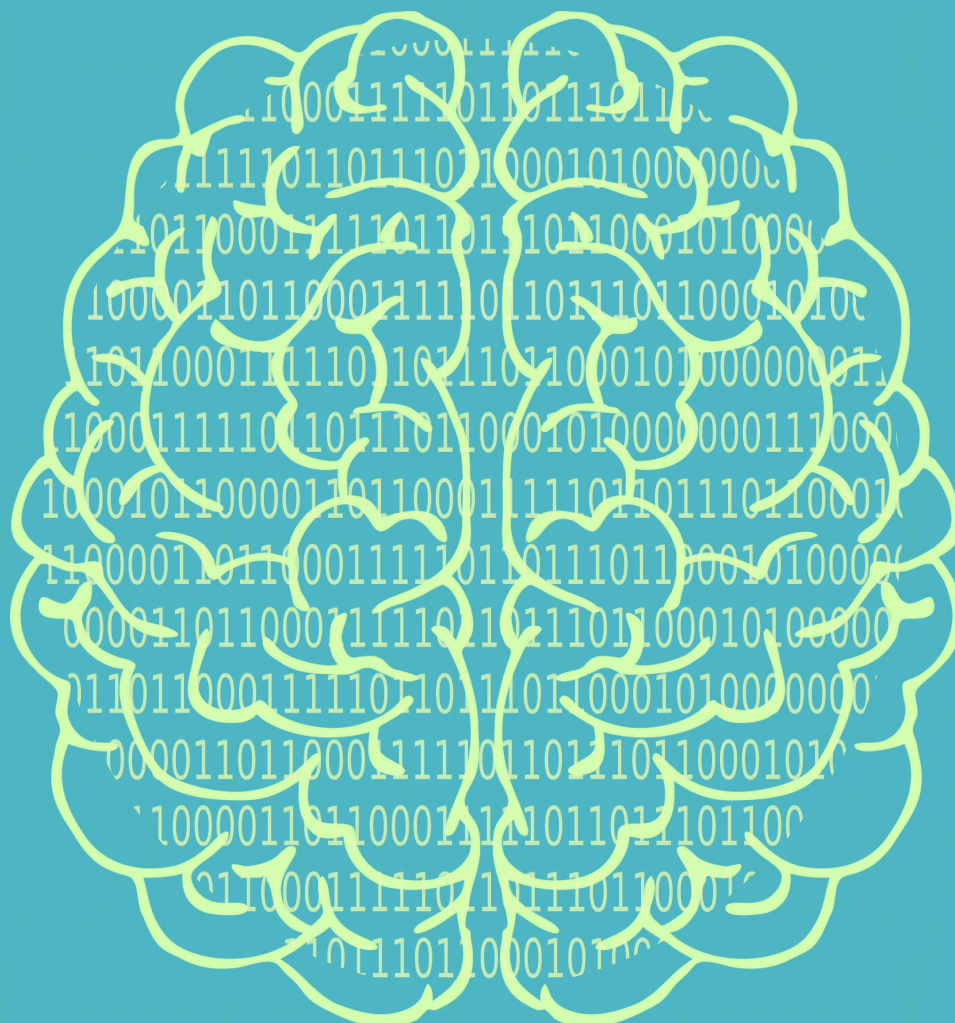
Basic courses (24 h each):
⇒ **Algebraic rewriting and categorification**
⇒ **Foundations of formalised mathematics and higher-dimensional rewriting**
⇒ **Introduction to LƎ∀N**

Advanced courses (24 h each):
⇒ **Rewriting theory of higher algebras**
⇒ **Calculus of Inductive Constructions and Coq**
⇒ **Advanced projects on LƎ∀N**

The advanced courses will particularly welcome the participation of PhD students and junior researchers.

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