

# Seminar: Applied category theory

**Description:** The aim of this seminar is to give an introduction to the new field of research called “applied category theory”. We will learn the basics of category theory while exploring many connections with areas of application outside of mathematics. The main reference will be the new book “Seven sketches in compositionality” by Fong and Spivak, see <https://arxiv.org/abs/1803.05316>.

The structure of the seminar will be designed to support an interactive and collaborative learning environment.

**Schedule:** Mondays, 15:00 - 17:00, in room Y27 H12 at the Irchel campus. The first meeting will take place on Monday, October 1st.

**For whom:** Bachelor and Master students (from 2nd year Bachelor onward). Prerequisites: Linear Algebra and Algebra, as well as a willingness to acquire a minimal proficiency using GitHub and LaTeX.

**Learning goals:** Proficiency in the basics of category theory; an understanding of a number of “applied” settings and their connections to categorical concepts; practice in reading, presenting, and participating constructively in discussions of mathematics; rudimentary skills in using GitHub and LaTeX.

**Topics:** With an emphasis on simple examples and applications, we will touch on: categories, functors, adjunctions, (co)limits | databases | monoidal and enriched categories | profunctors | categorification | signal flow graphs | props | graphical calculi | hypograph categories | operads | circuits and network diagrams...

**Coordinator:** Jonathan Lorand; if you have questions, write me!

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**Credits:** 3 ECTS points. Required is weekly reading and short, written reading responses, as well as a presentation of a topic. Grading is Pass/Fail.

**Module booking:** Space is limited to 12 participants; please contact me via email as soon as possible if you are interested in participating. The module is “MAT 563 Seminar: Applied category theory” in the University of Zurich course catalogue.

**Website:** <http://user.math.uzh.ch/lorand/ACT/sem.html> This will be the main source of information (and not the official UZH course page).