CATEGORY THEORY

IVAN DI LIBERTI

The following is the description of the forthcoming course in Category Theory.

Info

Title: Category Theory.
Locat: CAS, Institute of Mathematics, Blue lecture room.
Time: Every Tuesday. 15-17. Each lecture lasts 90 minutes.

Prerequisites and intended audience

The course is open to bachelor, master students and researchers that are not familiar with the topic. The audience is expected to have attended an introductory course in **at least two** of the following topics: general topology, algebraic topology, group theory, module theory, universal algebra, model theory.

Syllabus

(1) Toy Category Theory: posets;
(2) Categories, functors, natural transformations;
(3) Yoneda: Presheaves, representability, Yoneda embedding;
(4) Limits and Colimits;
(5) Adjunctions;
(6) Monads;
(7) Kan extentions;
(8) Towards enriched categories: monoidal (closed) categories and enrichments.

Achtung! The sections 7 and 8 might be subject to modifications, according to the time left at the end of the course.

Bibliography

(1) *Leinster*, **Basic Category Theory**. Probably the best introductory text, unfortunately it covers only the modules from 2 to 5.
(2) *Riehl*, **Category theory in context**. It's the perfect reference for this course, covers modules from 2 to 7.
(3) *Borceux*, **Handbook of categorical algebra, Vol. I & II**. A valid (but much more ambitious and a bit outdated in the style) alternative to the previous two references. It covers the whole course. We will follow the Vol. II for module 8.

Further Readings

(1) https://diliberti.github.io/Read/Read.html. A collection of suggested readings aiming to navigate the literature in Category Theory and Categorical Logic.