

Spring 2024

MATH 5710 / LGIC 3200 / PHIL 4722 / PHIL 6722, T Th 1:45 - 3:15 p.m. EST.

Logic and Computability 2: Introduction to Category Theory and Type Theory

Professor Andre Scedrov

Professor Scedrov's Office: DRL 4E6.

Professor Scedrov's Office Hours: Online by appointment.

Prerequisites

Math 5700 / Lgic 3100 or permission of the instructor.

References

Samson Abramsky and Nikos Tzevelekos: "Introduction to Categories and Categorical Logic",
<https://arxiv.org/pdf/1102.1313.pdf>

Egbert Rijke: "Introduction to Homotopy Type Theory". Part I, Martin-Löf's Dependent Type Theory.
<https://arxiv.org/pdf/2212.11082.pdf>

Further References

Saunders Mac Lane: "Categories for the Working Mathematician". Graduate Texts in Mathematics, vol. 5, Springer New York NY, Second Edition, 2010. ISBN: 978-1-4419-3123-8. DOI:
<https://doi.org/10.1007/978-1-4757-4721-8>

Michael Barr and Charles Wells: "Category Theory for Computing Science", Revised, 2020.
<https://www.math.mcgill.ca/barr/papers/ctcs.pdf>

Topics Covered

Categories, Basic Constructions in Categories, Functors, Natural Transformations, Universality, Limits and Colimits, Adjoints, The Curry-Howard Correspondence, Linearity, Monads and Comonads, Algebras and Coalgebras, Dependent Type Theory, Dependent Function Types, Inductive Types, Identity Types, Universes.

Basic Course Information

There will be two take-home midterms, the first one due in class on Thursday, February 22, 2024 and the second one due in class on Tuesday, April 16, 2024. Each midterm will be worth 33% of the grade and will have at least a two-week lead time.

The take-home final exam will be due Monday, May 13, 2024 during the final exam period and will be worth 34% of the grade. The take-home final exam will also have at least a two-week lead time.