

MAT 313/PHI 323, Advanced Logic (actually Category Theory)

Professor Hans Halvorson

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Office: 1879 Hall, Room 220. Office hours TBA.

Lectures on Monday, Wednesday at 3:30pm. Precept time TBA.

Required Textbooks: Jaap van Oosten, *Basic Category Theory* (www.math.uu.nl/people/jvoosten/syllabi/catsmoeder.pdf); Carsten Butz, *Regular Categories and Regular Logic* (www.brics.dk/BRICS/LS/98/2/); Handouts on Theory of Groups and Rings; Handout on Sheaf Semantics

Other possibly helpful books:

- Books on abstract algebra
 - S. Mac Lane and G. Birkhoff, *Algebra*.
 - P. Aluffi, *Algebra chapter 0*.
- Books on category theory
 - S. Awodey, *Category theory*.
 - F. Borceux, *Handbook of categorical algebra*, Vol I.
 - S. Mac Lane, *Categories of the working mathematician*.
- A book that surveys, “the abstract mathematics that you need to do physics,” organized by means of category theory
 - R. Geroch, *Mathematical physics*.

Requirements for receiving a grade: weekly problem sets (35%), take-home midterm exam (25%), take-home final exam (30%), in-precept presentation (10%).

Rough Schedule

W1: Review of sets and structured sets; Jaap chap 1

W2: Jaap chap 2

W3: Jaap chap 3

W4: Jaap chap 4

W5: Continue Jaap chap 4; Butz first half

W6: Butz second half; midterm exam

W7: Jaap chap 5

W8: Jaap chap 6

W9: Jaap chap 7

W10: Jaap chap 8

W11: Sheaf semantics (handout)

W12: Sheaf semantics (handout)