

COURSE SYLLABUS FOR MATH 261Y: VON NEUMANN ALGEBRAS

COURSE DESCRIPTION The goal of this course is to give an exposition of the theory of von Neumann algebras. If time permits, we will discuss the theory of subfactors and applications to the construction of topological quantum field theories.

MEETING TIME AND PLACE MWF 11:00, Science Center 113.

OFFICE HOURS Tuesdays at 3:00, Science Center 514.

TEXT We will not use a textbook. Lecture notes will be provided.

COURSE WEBSITE <http://www.math.harvard.edu/~lurie/261y.html>

PREREQUISITES Basic graduate-level analysis (measure theory, Hilbert spaces, the spectral theorem, etcetera), and some mathematical sophistication. Enrollment limited to graduate students (undergraduates are welcome to audit the course).

POSSIBLE TOPICS • Operator algebras.

- Commutative von Neumann algebras and measure spaces.
- States, weights, and traces.
- Factors of types I, II, and III.
- Direct integral decompositions.
- Tomita-Takesaki theory.
- Bimodules and Connes fusion.
- Subfactors and applications.