MATH 366 - OPERATOR ALGEBRAS - SPRING 2014

Instructor: Jesse Peterson
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Office: SC 1414
Office Hours:
   Mondays: 11:00-11:50am
   Wednesdays: 8:00-8:50am
   Wednesdays: 11:00-11:50am
   Or by appointment

Website: http://www.math.vanderbilt.edu/~peters10/teaching/spring2014/math366.html

Prerequisites: An introductory course in Functional Analysis.

Optional books: Notes for the course will be made available as the semester progresses. For a different perspective, we suggest the following.

   An Introduction to Operator Algebras by Kehe Zhu.
   ISBN: 0849378753.

   Banach Algebra Techniques in Operator Theory by Ronald Douglas.
   ISBN: 0387983775

Description:
   This course will be an introduction techniques from operator algebras. Topics covered will include:
- Abstract C^*-algebras and the Gelfand transform
- Continuous functional calculus
- Borel functional calculus and abelian von Neumann algebras
- Unbounded operators
- The GNS-construction
- Von Neumann's Double Commutant Theorem
- Kaplansky's Density Theorem

We will also discuss some applications of these techniques, depending on time:
- Geometry of projections
- Classification into types
- Stone's theorem and the Hille-Yosida theorem
- Examples of von Neumann algebras
- Reduction theory
- Locally compact groups and Haar measure
- Von Neumann and Mackey's point realization theorems

Grades:
   Grades will be based on class attendance/participation, homework (which will occasionally be assigned), and an in class presentations.

Seminar:
   The Subfactor Seminar is held each Friday from 4:10-5:30pm in SC 1432. This seminar focuses on topics from von Neumann algebras, subfactors, and related areas. Students who are planning to work in the area of operator algebras are expected to regularly attend the seminar. It is also the best opportunity for students who are considering working in the area and would like to get a feel for the subject. Afterwards feel free to join us for beer and pizza.