Topics in Analysis

Introduction to the Theory of Operator Algebras

MATH 992 Fall 2008

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PREREQUISITES: Real & Complex Analysis (MATH 821-822)

Functional Analysis is also desirable, but if you have not been exposed to it, it will be covered in the course (see NOTE below).

TEXTBOOK: None. (Pieces from Kadison-Ringrose Vol. 1-2, Davidson, Pedersen, Dixmier, Takesaki, etc. will be covered)

DESCRIPTION: Operator Algebras represent a very active area in Analysis. Although nowadays this field is branched in many directions, the initial objects of study are algebras that can be realized (faithfully) as algebras of linear continuous operators on Hilbert spaces. Although this restriction might appear to be somehow limiting, it runs out that Groups, Topology, Geometry and Probability Theory (to mention a few) all belong in a certain sense to the theory of commutative Operator Algebras, therefore most Quantum versions of Groups, Topology, Geometry or Probability have their natural place in the general theory of Operator Algebra. (Except for Groups, "Quantum" is often replaced by "Non-Commutative"). The goal of this course is to give the student an introduction to the basic theory, followed by several in-depth connections with Non-Commutative Geometry/Topology/Probabilty.

NOTE: DEPENDING ON THE BACKGROUND, THE PACE WILL BE ADJUSTED TO THE NEEDS OF THE PARTICIPANTS. In particular, all necessary Functional Analysis (desired) prerequisites will be thoroughly covered. (See for example Kadison-Ringrose Vol. 1, Chapters 1-3).

For additional information, contact Dr. Nagy.