MAT 598 Introduction to Research in C^*-Algebras Course Announcement

Professor: John Quigg   **Semester:** Spring 2024
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Description: In this course the objective is to read at least one paper in current research in C^*-algebras. The students will take turns presenting portions of the paper until we decide that we have seen enough of it. Time permitting, we will repeat this process for the duration of the semester.

There will be no formal homework or exams. Participation in the course activity — reading papers — will form the basis for the grade.

A bit of introduction: C^*-algebras is the mathematics that grew out of quantum mechanics in the early 20th century, and in the past fifty years has expanded into many other areas. For a long time C^*-algebras have been used in the study of group representations, and they've also been applied to dynamical systems, "noncommutative geometry", "free probability", graph theory and other combinatorial structures, and number theory, among other things. Although a part of analysis (more precisely, functional analysis), the area of C^*-algebras makes heavy use of lots of other math, for example algebra, topology, combinatorics, and geometry.

Prerequisites: Instructor approval, and "mathematical maturity". Beyond the basics of functional analysis, it would help to have some familiarity with tiny bits of (abstract) algebra, complex analysis, and topology.

However, I want to emphasize that, regardless of your background, if you are at all interested in this course, please contact me at quigg@asu.edu or WXLR 728.

Textbook: There is no required text. I hesitate to mention specific background references, because there is no particular preparatory subject material, but for completeness:

- W. Arveson, "A short course on spectral theory", Springer-Verlag, 2002.
- J.B. Conway, "A Course in Functional Analysis", 2nd ed., Springer-Verlag, 1990.
- G.B. Folland, "Real Analysis", 2nd ed., Wiley, 1999.
- G.J. Murphy, "C^*-algebras and operator theory", Academic Press, 1990.
- G.K. Pedersen, "Analysis now", Springer-Verlag, 1989.
- W. Rudin, "Functional Analysis", 2nd ed., McGraw-Hill, 1991.