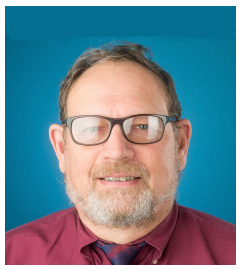
# Mathematical Sciences
# Spring 2024 Colloquium Series



## Dr. Alexey L. Sadovski

Texas A& M University-Corpus Christi

**Wednesday, May 8 at 3:00pm**
**Bell Hall 130 and online via Zoom**
*Note the unusual day*
*Scan the QR-code to access the link*

# On Arrow Paradox: Preference Ranking and Decision-Making Mechanism Based on Rating Method and Expert Information

## Abstract

This paper deals with group decisions based on the rating methods of fuzzy and regular preference rankings. The preference ranking is one of the methods to solve so-called selection problems. Selection problems are very important for decision making in unique systems such as medical, environmental, or ecological ones. Very often the right decision is based upon expert information. In this paper we deal with some approaches to the choice of the best variants, and its application to the multi-criteria optimization and decisions. This paper presents axiomatic systems of rating methods of preference ranking based on fuzzy expert information. Results include the convergence of consensus ranking to the real ranking almost everywhere, the inclusion of the consensus ranking into the Kemeny Median set, and that consensus ranking almost always (with probability one) satisfies all five Arrow axioms. It is shown that contemporary rating systems, (for instance those used in sports classifications), are congruent in the sense of producing the same final preference ranking.

**Host: Dr. M. Christina Mariani**

**For further information, please contact Dr. Emil Schwab, eschwab@utep.edu**