



**KENNESAW STATE**  
**UNIVERSITY**

COLLEGE OF SCIENCE AND MATHEMATICS

*Department of Mathematics*

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# Discrete Mathematics Seminar<sup>1</sup>

Friday, February 19, 2021  
2:30–3:30pm (Microsoft Teams)

Title: *Extendability of  $k$ -suitable matchings in Cartesian products*

Speaker: Dr. Erik E. Westlund, Associate Professor, Department of Mathematics, Kennesaw State University

ABSTRACT: A graph  $G$  is  $m$ -extendable if  $m < |V(G)|/2$  and every matching of size  $m$  extends to a perfect matching. The largest value for which a graph  $G$  with a perfect matching is  $m$ -extendable, called the *extendability* of  $G$ , has been studied at length. We discuss a relatively new direction for examining extendability. A matching  $M$  with vertex set  $U$  is  $k$ -suitable if  $G - U$  has no deficient set of size less than  $k$ . We define the extremal function  $f_k(G)$  to be the largest integer  $r$  such that every  $k$ -suitable matching in  $G$  with at most  $r$  edges extends to a perfect matching. In this talk, we discuss known results on  $f_k(G)$  for the hypercube graphs, and show that analogous results hold for a much larger family of graphs, namely Cartesian products of even cycles. We also pose some open questions for future research. This is joint work with Jennifer Vandenbussche.

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<sup>1</sup>The Discrete Mathematics Seminar (DMS) is intended for Kennesaw State faculty working in the various areas of algebra, number theory, and discrete mathematics to get together to discuss their current work or related questions. Seminars often involve advanced mathematical knowledge. However, the seminars are open to anyone who is interested in attending.