CoE-MaSS weekly seminar series

THE DST-NRF CENTRE OF EXCELLENCE IN MATHEMATICAL AND STATISTICAL SCIENCES (CoE-MaSS) WOULD LIKE TO PRESENT A SEMINAR BY

Prof Michael Henning
(Department of Pure and Applied Mathematics, University of Johannesburg, South Africa)

"Total Domination in Graphs and Transversals in Hypergraphs"

Friday, 21 April 2017
10h30-11h30

Broadcast live from:
Videoconferencing Facility, 1st Floor
Mathematical Sciences Building, Wits West Campus

How to connect to this seminar remotely:
You can connect remotely via Vidyo to this research seminar by clicking on this link:
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You must please join in the virtual venue (called *"CoE Seminar Room (Wits)"* on Vidyo)
strictly between **10h00-10h15**. No latecomers will be added.

Important videoconferencing netiquette:
Once the seminar commences, please mute your own microphone so that there is no feedback
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if you have a question to ask the speaker.

Title:
Total Domination in Graphs and Transversals in Hypergraphs

Presenter:
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Abstract:
The total domination number of a graph G is the minimum cardinality of a set S of vertices so that every vertex of G is adjacent to a vertex in S, while the transversal number of a hypergraph H is the minimum cardinality of a subset of vertices in H that has a nonempty intersection with every edge of H. Much of the recent interest in total domination in graphs arises from the fact that total domination in graphs can be translated to the problem of finding transversals in hypergraphs since the transversal number of the open neighbourhood hypergraph of a graph is precisely the total domination number of the graph. We explore this transition from total domination in graphs to transversals in hypergraphs and discuss several recent results on total domination in graphs obtained using transversals in hypergraphs that appear difficult to obtain using purely graph theoretic techniques. For example, we prove the conjecture that if G is a quadrilateral-free graph with minimum degree at least 4, then the total domination number is at most two-fifths the order. In order to prove this result, we first prove some key results on transversals in linear hypergraphs, as well as results on matchings in graphs.