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# *Graduate Mathematics Seminar*

## The Untwisting Number of a Knot

**Dr. Kenan Ince**  
*Westminster College*



**Abstract:** The *unknotting number* of a knot is the minimum number of crossings one must change to turn that knot into the unknot. We work with a generalization of unknotting number due to Mathieu-Domergue, which we call the *untwisting number*. The  $p$ -untwisting number is the minimum number (over all diagrams of a knot) of full twists on at most  $2p$  strands of a knot, with half of the strands oriented in each direction, necessary to transform that knot into the unknot. The *untwisting number* is the minimum  $p$ -untwisting number over all  $p$ . We show that the unknotting and untwisting numbers can be arbitrarily different, though their algebraic analogues are always equal. We find conditions on the Heegaard Floer correction terms of the branched double cover of a knot with untwisting number one, allowing us to obstruct several 10 and 11-crossing knots from being unknotted by a single positive or negative twist. Finally, we use the Ozsváth-Szabó tau invariant and the Rasmussen  $s$  invariant to differentiate between the  $p$ - and  $q$ -untwisting numbers for certain  $p, q > 1$ .

*When:* Monday, October 21, 2019, 6:00 – 7:00 pm

*Where:* CSUCI, Sierra Hall 2411

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