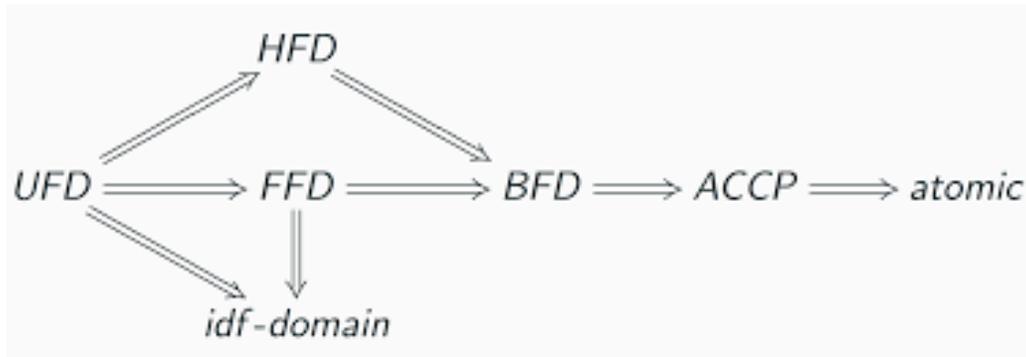


West Chester University  
Fall 2022 Mathematics Colloquium

presents

**JIM COYKENDALL**

Clemson University



## “Exploring Some Pathologies in Factorization Via Examples”

Wednesday, October 26, 2022 from 3:00 to 3:50PM  
Anderson 211

(attend via Zoom: <https://wcupa.zoom.us/meeting/register/tJcvde2grj0tG9RLH4t6DpcjgGGgBA82X8QE>)

Factorization, that is, the way objects decompose multiplicatively, is a central notion in algebra. Its fundamental role makes it one of the earliest topics of study (usually first seen in a primitive form in high school). UFDs are often studied at the beginning abstract algebra level as they are the domains where the Fundamental Theorem of Arithmetic holds (specifically, every nonzero nonunit of the domain can be factored uniquely into primes). But the study of factorization goes far deeper than the niceness of UFDs and this is what we will explore. Mostly through examples, we will look at domains with exotic factorization properties in the zoo of commutative algebra and produce a couple of surprising examples and theorems. As a teaser, we ask if you can think of a domain where not everything factors into irreducibles. Can you think of a domain where there are no irreducibles at all? How about a ring with no irreducibles with polynomials that are irreducible? We will explore these questions and more. This talk will lean heavily on examples rather than rigorous proof to give the audience and intuitive “big picture” of some of the beauty of this field.

*Jim Coykendall is a Professor of Mathematics at Clemson University. He obtained his BS from Caltech in 1989 and his PhD from Cornell University in 1995. He spent a year at Lehigh University as the C. C. Hsiung Visiting Professor of Mathematics and then 17 years at North Dakota State University where he won a number of awards for teaching and research as well as serving as chair of the department. In 2013 he came to Clemson as chair and has been a professor for the past 6 years. He has graduated 13 PhD students and is currently mentoring 9.*

**For further information e-mail [mfisher@wcupa.edu](mailto:mfisher@wcupa.edu)**