Bi-State Math Colloquium

Who: Kyle Czarnecki
When: Thursday, November 29, 4:00 pm
Where: Ottensman 122, UW-Platteville

Zeta Functions and Arithmetic Functions

The Fundamental Theorem of Arithmetic states that every positive integer can be factored uniquely as a product of primes. In other words, the prime numbers are the generators of the integers. One of the great achievements of classical analytic number theory is the Prime Number Theorem (PNT) which relates the growth of the primes to the growth of the integers. The proof of the PNT relies on properties of certain arithmetic functions associated to the Riemann zeta function.

In this colloquium, we will survey some basics ideas behind abstract analytic number theory – a modern branch of number theory which seeks to generalize classical analytic number theory and the PNT from the integers to other algebraic structures (to arithmetical semigroups, in particular). After a brief introduction to the Riemann-Stieltjes integral, we will explore the connection between the Riemann zeta function and the prime counting function as well as to other classical arithmetic functions (e.g. the divisor function, Euler's totient function, etc.). We will conclude with discussing how all of these functions can be defined for algebraic structures other than the integers. The talk should be accessible to anyone with a working knowledge of calculus.

Kyle Czarnecki is an Assistant Professor in the Mathematics Department at UW-Platteville. He received his Ph.D. from the University of Iowa where he studied L-functions and automorphic forms. In his spare time he enjoys losing at chess and playing the piano poorly.