

CCSU  
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, April 21

3:00 – 4:00 PM

Maria Sanford, Room 101

WEIERSTRASS REPRESENTATION  
FOR MINIMAL SURFACES

JAMES CHADIC

(MA in Mathematics Thesis Presentation)

CENTRAL CONNECTICUT STATE UNIVERSITY

**Abstract:** An important aspect when studying problems in mathematics is to have the ability and flexibility to investigate a topic from several perspectives. In this talk, we will demonstrate a bridge between the theory of Minimal Surfaces (which is a field of Geometry) and Complex Analysis (which is a field of Analysis), by using the Weierstrass Representation Method. We will be using this powerful method to generate minimal surfaces, by way of determining holomorphic functions that represent some well-known minimal surfaces (such as the Helicoid, Catenoid, the Enneper Surface etc...).

In this talk, we will define and explore regular surfaces, study the properties and the benefits of computing the coefficients of the First Fundamental Form, explore the Weigarten Equations. After analyzing the Enneper surface (which is a minimal surface that is parametrized by a polynomial of degree three) we will focus on trying to find minimal surfaces using polynomial parametrization. Moreover, by applying similar methods to the Helicoid with the parametrization  $\mathbf{X}(u, v) = (u \cos(v), u \sin(v), v)$ , we will investigate the possible isothermal parametrization that can be produced by multiplying each component by a factor, and whether one can get back the original surface.

***For further information:***

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