CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES
COLLOQUIUM

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3:00 – 4:00 PM
Maria Sanford, Room 101

COMPARING THE ACCURACY OF TWO DIAGNOSTIC TESTS IN DIAGNOSTIC MEDICINE

KRISHNA SAHA
CENTRAL CONNECTICUT STATE UNIVERSITY

(Joint work with Suojin Wang and Nargis Akhter)

Abstract: Diagnostic tests play a vital role by providing reliable information about the patient's health condition. Given its importance, there is considerable interest in studying the accuracy of the tests. Diagnostic test accuracy is simply the ability of the test to discriminate between patients with or without the condition. If the test is negative, should the health care provider assume that the patient is disease-free and thus send him/her home? If the test is positive, should the health care provider assume that the patient has the condition and thus begin treatment? To answer these critical questions, the health care provider needs to have information on the accuracy of the test: How does the test perform among patients with the condition (i.e., the test's sensitivity)? How does the test perform among patients without the condition (i.e., the test's specificity)? Does the test serve as a replacement for an older test or should multiple tests be performed? These sorts of questions are addressed in diagnostic test accuracy studies. There is no question that diagnostic test accuracy studies are challenging to design and require specialized statistical methods for their analysis. In this talk, I will present a variety of designs for collecting the data in diagnostic test accuracy studies. I will also discuss the choice of statistical methods to analyze such data in order to compare the accuracy of two diagnostic tests. A variety of applications in diagnostic medicine will be used to illustrate the choice of statistical methods in order to determine the diagnostic test accuracy.