2012 - 2013

MATHEMATICS COLLOQUIUM SERIES
UNIVERSITY OF CENTRAL FLORIDA

Dr. Shigui Ruan
Department of Mathematics
University of Miami

will speak on

Hopf Bifurcation in Semilinear Equations with Application to Influenza A Drift

Abstract: Several types of differential equations, such as functional differential equations, hyperbolic partial differential equations, and evolution equations with nonlinear boundary conditions, can be written as non-densely defined semilinear Cauchy problems. We first establish a Hopf bifurcation theorem for abstract Cauchy problems in which the linear operator is not densely defined and is not a Hille-Yosida operator. Understanding the seasonal/periodic reoccurrence of influenza will be very helpful in designing successful vaccine programs and introducing public health interventions. However, the reasons for seasonal/periodic influenza epidemics are still not clear even though various explanations have been proposed. Next we present an age-structured type evolutionary epidemiological model of influenza A drift and show that Hopf bifurcation occurs in the model. This demonstrates that the age-structured type evolutionary epidemiological model of influenza A drift has an intrinsic tendency to oscillate due to the evolutionary and/or immunological changes of the influenza viruses.

DATE: **Friday, November 9, 2012**

TIME: **2:30 pm**

PLACE: **MSB 318**

Refreshments will be served.