BI-CO MATHEMATICS COLLOQUIUM

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"Delay Differential Equations with Applications to the Analysis of the Spread of Vector-Borne Diseases"

Monday, February 25, 2019
Talk at 4:00 – H109
Tea at 3:30 – Foyer outside of H109

Abstract:

Many problems in engineering and applied sciences give rise to delay differential equations. These are differential equations in which the current rate of change of the system depends not only on the current state but also on the history of the system; i.e. the system has memory. In this talk, we will discuss the stability of equilibrium solutions for a two-lag delay differential equation which models the spread of infectious diseases; namely, vector-borne diseases where the lags are incubation periods in humans and vectors. We show that there are some values of the transmission and recovery rates for which either the disease dies out or it spreads into an endemic state. Through MATLAB simulations, we also observe that the solution could possess uncontrolled behavior.

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