CCSU

DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, April 14
3:00 – 4:00 PM
Maria Sanford, Room 101

DIFFERENTIAL EQUATIONS FOR MODELING LONG-TERM DEVELOPMENT OF DIABETES

VIKTORIA SAVATOROVA

CENTRAL CONNECTICUT STATE UNIVERSITY

Abstract: In this talk we discuss a model that uses a system of nonlinear ordinary differential equations to explain the behavior of the glucose regulatory system and possible pathways to diabetes. The primary variables of the system are beta-cell mass, plasma insulin concentration and plasma glucose concentration.

We specify equilibrium solutions for the system and perform stability analysis. Another topic for our discussion is parameter sensitivity analysis which is used to decide how much does the output change as we change parameters of the model one-at-a-time.

The development of diabetes is considered as a result of a bifurcation that occurs when equilibrium changes its stability due to parameter variations. Bifurcation diagram is provided to demonstrate the possibility of bifurcation pathway to diabetes. Numerical simulations are given to support theoretical analysis.

To join us online use the following link: https://ccsu.webex.com/meet/gotchev
For further information: gotchevi@ccsu.edu; 860-832-2839;
http://mathcolloquium.sites.ccsu.edu/