



UNIVERSITY OF
CENTRAL
ARKANSAS™

DEPARTMENT OF MATHEMATICS MASTER THESIS DEFENSE

SPEAKER: Brandon Ashley, Graduate Student
Department of Mathematics

Title: Asymptotic Tracking and Disturbance
Rejection of the Blood Glucose Regulation
System

Date: Tuesday, July 12, 2016

Time: 2:00-3:00 pm

Place: MCS 220

For people with type 1 diabetes, the pancreas does not correctly secrete the amount of insulin to keep the concentration of glucose in the bloodstream within the desired range. To correct this, external insulin pumps have been designed to control the blood glucose system. Mathematically, we can represent these systems as a control model with multiple feedback controllers. For the blood glucose system in particular, it is desirable for controllers to stabilize the system about some reference point while correcting for various disturbances in the glucose levels. Here we wish to design controllers for a blood glucose system about some reference and subject to functional disturbances using asymptotic tracking and disturbance rejection methods.