



cordially invites you to a

Special Seminar

with

Dr. Richard Rebarber

on

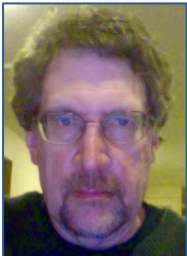
“Feedback control approaches to population management”

Thursday, March 23, 2017

3:30-5 p.m.

Reception & refreshments at 3 p.m.

Hallam Auditorium, Room 206
1122 Volunteer Boulevard



Richard Rebarber is a Professor of Mathematics at the University of Nebraska, Lincoln. He received his Ph.D. from the University of Wisconsin, Madison in 1984, with thesis work in control theory. His current research interests include feedback control and population dynamics. He has been the long-time director of an applied mathematics REU Site and has extensive experience mentoring undergraduate research.

Abstract: We describe three novel uses of feedback control for population management problems, and give case studies for each of them. We assume that the controller has sampled access to an observation of the system, for instance, a count of those members in the reproductive stage of the population. The problems and tools we will discuss are: (1) For the eradication of an invasive species, we propose the use of high gain tracking to determine effective and robust application of pesticide or biological control; (2) For the conservation of an endangered species, we propose the use of low gain tracking to determine effective and robust restocking (such as replanting); (3) To robustly identify the entire state of the system and improve the estimates of the system parameters, we can use the Kalman filter. These types of controllers do not minimize cost like optimal control will, but they can work in the presence of quite a bit of uncertainty.