1116-00-2997 **Sarah Day***, The College of William & Mary, Williamsburg, VA 23185. *Dynamics and Chaos For Maps and The Conley Index*

Discrete-time dynamical systems modeled by iteration of continuous maps exhibit a wide variety of interesting behaviors. One illustrative example is the one-dimensional logistic model. For the logistic model, chaotic dynamics may be proven via a topological conjugacy onto an appropriate subshift of finite type, a symbolic system for which a proof of chaos is attainable. Analysis and proofs of dynamics for other discrete-time models, especially in dimensions larger than one, often prove to be more challenging. In this course, we examine methods for constructing *outer approximations*, finite representations of discrete-time models that are amenable to computational studies and computer-assisted proofs. These methods rely heavily on *Conley index theory*, an algebraic topological generalization of Morse Theory. Both theory and algorithms will be presented in this course. Studies of models including pulse-coupled oscillator systems and the infinite-dimensional Kot–Schaffer model from ecology will serve as illustrations of the methods. (See http://www.ams.org/meetings/short-courses/short-course-general#day for list of references.) (Received December 03, 2015)