This talk will present the basic ideas underlying optimal control of ordinary differential equations. Source terms or rate coefficients in the differential equations are taken as control functions to be adjusted to achieve a specified goal. Following a simple case from Pontryagin’s Maximum Principle, the technique for finding ‘an optimal control’ will be presented. Some illustrative examples will be shown.

This talk extends the introduction of optimal control to systems of ODEs. Cases with the linear and nonlinear dependence on the controls will be compared. Examples of management strategies in infectious disease models will be shown.

This talk will present optimal control of discrete time models with two main examples. The first example involves difference equations that model cardiopulmonary resuscitation. The goal is to design an external chest and abdomen pressure pattern to improve the blood flow in the heart in standard CPR procedure. The second example is an epidemic model for rabies in raccoons on a spatial grid. The goal is to find the optimal distribution pattern for vaccine baits to slow the spread of the disease.