

MATH 315: Fall 2024
Assignment 10

Due: Wednesday, October 16

Your team's job on this assignment is to build and analyze a mathematical model of the dynamics of interacting species.

Select at least one of the following models:

- (1) Leslie-Gower model of predator-prey (Variation 3 in "Modifying the Model" in Chapter 4);
- (2) The predator-prey model in which each species experiences logistic growth in the absence of the other species (Variation 2 in "Modifying the Model" in Chapter 4);
- (3) A competitive hunters model in which each species experiences logistic growth in the absence of the other species (this is mentioned in Chapter 4 but no explicit equations are given),
- (4) The Rosensweig-MacArthur implementation of the Harrison model incorporating a particular functional response (page 130), or
- (5) A model of your own creation for competition or predator-prey that reflects assumptions you believe are more realistic than the ones represented in the text's models.

Analyze the model(s) using the mathematical techniques we have been discussing and introducing in the course together with any other mathematical tools you have learned. The models should be nonlinear systems of differential equations.