

MAT4996: Final Assignment (due April 19)

Create a mathematical model for the disease of your choice. You may work in teams if you wish.

Include some background on this disease (at least four paragraphs), along with references. This should be a real disease and preferably one that interests you. You should have at least 10 academic references. (Websites don't count, although you may include them as well if you wish.)

- (a) Draw a flow diagram of the model
- (b) Write down the differential equations (using parameters, not numbers)
- (c) Calculate the disease-free equilibrium
- (d) Find the Jacobian
- (e) Determine the stability of the disease-free equilibrium
- (f) Write down R_0 (you may use any legitimate method)
- (g) Decide upon some likely parameter values (include units for each parameter)
- (h) Determine the long-term outcome of this disease
- (i) Describe any interesting or unexpected features of this disease not included in the above list.

Add a conclusion summarising your findings.