

Math 2410 Section 1.3 Supplemental

**Example 1**

Suppose a student carrying a flu virus returns to an isolated college campus of  $n$  students. Determine a differential equation governing the number of students  $x(t)$  who have contracted the flu if the rate at which the disease spreads is proportional to the number of interactions between students with the flu and students who have not yet contracted it.

**Example 2**

Suppose that a large mixing tank initially holds 300 gallons of water. Another brine solution is pumped into the tank at a rate of 3 gal/min, and when the solution is well stirred, it is then pumped out at the same rate of 3 gal/min. If the concentration of the solution entering is 2 lb/gal, determine a differential equation for the amount of salt  $A(t)$  in the tank at time  $t$ .