MAP 4484 Modeling in Mathematical Biology: Disease Dynamics

Topic Outline:

I. Introduction to Disease Dynamics

A. Definition of Disease Dynamics

1. Overview of the different types of diseases
2. Explanation of how diseases spread and evolve

B. Mathematical Modeling of Disease Dynamics

1. Differential equations and their applications
2. Stochastic models and their applications
3. Agent-based models and their applications

Problem Solving Strategies:

1. Understand the basic concepts of disease dynamics and the different types of mathematical models used to study them.

2. Develop an understanding of the different types of differential equations and how they can be used to model disease dynamics.

3. Learn how to use stochastic models to analyze the spread of diseases.

4. Become familiar with agent-based models and their applications in disease dynamics.

5. Practice problem solving by working through example problems related to each type of model.

6. Utilize diagrams and visualizations to help explain complex concepts.

7. Develop a systematic approach to problem solving by breaking down the problem into smaller parts.

8. Think critically and logically about the problem and consider all possible solutions.