# Topics in Applied Mathematics: *Mathematical Modeling*

Math 396 Spring 2021 https://zoom.us/j/83746366935 T 10:15am - 11:40am
 http://sites.oxy.edu/ron/math/396/21/

## *Week 5*: Tuesday February 16

**TITLE** ODE Models of Epidemics

**CURRENT READING** Articles on Mathematical Modeling of COVID-19 Dynamics and Control (Gumel et al, 2020). Mathematical Explanation of SIR Disease Model for COVID-19 (25 minute YouTube video)

**NEXT READING** Prepare for guest lecture by Prof. Jorgen Harris on probabilistic models of workplace discrimination by reading papers found at: https://sites.oxy.edu/ron/math/396/21/models.html

**SUMMARY** Today we will have a guest lecture from Prof. Sherry Scott. She will discuss a models for disease involving ordinary differential equations and discuss how these models can be used to describe dynamics of COVID-19.

think about the following questions:

1. How does one connect compartments to differential equations?

2. How can one solve the system of ODEs?

3. What are the strengths and drawbacks of the model?

RECALL: **The 5 Step Modeling Approach**

1. Ask the question
2. Select the modeling approach
3. Formulate the model
4. Solve the model
5. Answer the question

GROUPWORK

Question **How can we apply the 5-step method to the SIR Model?**

Question **What situation or question would you like to apply the SIR model to?**

Question **(How) Can you connect ideas of sensitivity analysis and robustness to the SIR model?**