**Math 65 Fall 2017 Final Project  
COMPARTMENT MODEL FESTIVAL**

*This document (11/20/17) is to get you started thinking about your project topic and plan of action with your team. We’ll refine it and provide an updated version in about a week.*

The idea of this project is to see the power of compartment models to describe many kinds of situations. Here’s what your team will do.

1.  Choose a societal issue that matters to your group. Pick a topic of your choice related to this issue. Add your topic to this Google Spreadsheet. We don’t want overlap of topics in the same section, so if you see another team already has that topic, you need to pick a new one. This should be an incentive to settle on something relatively soon.

https://docs.google.com/a/g.hmc.edu/spreadsheets/d/1Uyqi6nZgaCeceFe2DjHAJFW2dfjVpaJGyAxoMY7DUIs/edit?usp=sharing

2.  Learn about your topic. Keep track of your sources of information so that you can cite them. You might want to interview HMC professors if their research is connected to your topic.

3. Decide what question you might answer with a compartment model. In your notes, the compartment model is the one for lead in the body, but compartment models can be used in many different contexts.

4. For your topic and question, as a group try to create the simplest sensible model. It should have 2-4 compartments. Write the DEs for the model and solve it with software.

5. Note what assumptions you made to create this simple model.

6. Visualize the solutions in a compelling way. Make sure your plots are readable by having large enough fonts and line thicknesses. You make use color, but also use shape and linestyle so that it is readable if it is printed in greyscale or black and white.

7. Find or collect some data or use another approach to validate your model. How good or terrible is the simple version and why?

8. After you have completed the simple model, each person in the group should choose their own way to modify the model. The idea is to make a modification that might improve the usefulness or fidelity of the model. That teammate should note assumptions, solve this model and visualize the solutions.

9. Finally the group should come back together and make a final model by combining the most useful modifications.

10. Prepare an 8 minute presentation with slides. This leaves a couple of minutes for Q&A for a total of 10 minutes per group. Make sure everyone presents for about the same amount of time. Use the vocabulary from our class as much as possible (including equilibria, classification, stability, forcing, etc). We’ll give you a list of vocabulary we hope you will include. Discuss the effect of the modification to the simple model. Some will be more useful than others. Try to explain why. Also discuss how models related to your topic might have societal impact. Turn your slides in on Sakai dropbox.

11. Effective talks will tell a compelling story with an appropriate level of depth rather than outline every detail of what you did. Those details will appear in a writeup that describes your process, model and solutions. It should be between 5 and 10 pages, including figures. Make sure the section number and all team member names are on the front. Each teammember is responsible for the section about their individual work. You should have a compelling title and references to sources. Upload to Sakai dropbox.