MATH 210 PROJECT GUIDELINES

The final project is your chance to make use of what you’ve learned in this course. The project has two components: the research (learn about your topic), and the write up (describe what you have learned).

Research:
Use the techniques you have learned throughout the semester in doing the research:
- Figure out what variables and parameters you want to use and write down explicitly what each one represents.
- Write out the equations for the model. Explain to yourself (and your partner) what the terms in the equations represent.
- Draw diagrams and graphs to clarify and help you understand the problem.
- Determine the units for the variables and parameters.
- Find equilibrium points and determine the stability of these points.
- Use the computer to give you graphical/visual information about how the system is behaving.

Paper:
The target audience for your paper is students in our differential equations course. Write your paper so that fellow classmates will understand it. Your paper should include the following sections:

Introduction:
- Why should the reader care about this topic?
- Provide the relevant background information necessary to understand the problem.
- Clearly state why mathematical modeling is useful for studying this problem; what does modeling contribute to the study of this problem that otherwise could not be investigated?

Model Formulation:
- State the basic assumptions in your model, and clearly explain the formulation of your model.
- State clearly what the units are for the variables and parameters.
- You can draw diagrams and/or graphs to clarify and help explain your problem. Be sure to include a description of what the diagram/graph is showing—the meaning of the diagram/graph should be very clear to the reader.

Results:
- You may need to break up your results section into appropriate subsections.
- Show the results of your analysis and numerical simulations.
- Show any non-trivial steps in your analysis.
- Where appropriate, logically present tables and label with captions, legends, etc. Axes should be properly labeled.
- Use the language/terms we have learned in the course: example—”to solve this non-homogeneous linear equation we ...” or “we find the linear approximation at the equilibrium point...”
Discussion:
- State the predictions of your model, and carefully discuss the implications of each prediction.
- How do these predictions support or refute current thinking of this problem?
- Discuss limitations of your approach.
- Include a brief paragraph in which you mention some problems, questions, issues that this project has lead you to wonder about that you (or another researcher) might want to examine in the future.

Length: Your paper should be 10 – 15 pages long and should be type written.

The project modules can serve as a guide to your work. You get to decide how closely you follow the module.

Teamwork Report:
Each person on the team will write one paragraph on the role of each member of the team and how well each member contributed to the final project. In your paragraph, state how you would distribute 10 points between the team members. You can email me your teamwork report.