

# MATH 442: Mathematical Modeling

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## Final Portfolio – due Friday 5/3/2013 by midnight

**Instructions** You are to do the main work to create this portfolio alone. Go over your contributions to past assignments and use them to answer the following questions. You are urged to have a classmate or someone from the writing center read over and comment on your portfolio before you hand it in. The final portfolio should help you to realize what you've learned and how you've grown this semester. Reflect on the work you've done in the assignments and projects and your understanding. You are welcome to come speak with me if you have further questions about creating your final portfolio.

These are the main deliverables for the portfolio.

- A letter to me (Dr. Linhart) reflecting on and telling me about what you learned in the course.
- A letter to a friend taking the class in a future semester with advice on how to succeed in the course.
- A writing sample that you discuss in the letter to me.
- Either some graphs or a MATLAB code sample that you discuss in the letter to me.

**Letter to Dr. Linhart:** Write a 1000-1500 word (2-3 page) letter to me discussing what you learned in this course. You should include thoughts on your writing sample and on the code or graph sample you are including in this portfolio. You can look over the learning objectives in the first day handout to remind yourself of what I was hoping you would learn, but that said, the most important things you take away from a class may not be related at all to the course learning outcomes; if this is so, please tell me about it.

Here are some other ideas:

- a) What mathematical models did you learn about in the course that you didn't know about before?
- b) You probably worked with classmates on the projects in this class. What experiences did you have? Were your experiences good or bad? What would you do the same? What would you do differently? What did you learn about the art of working with others?

- c) How did your final presentation go? What presentations did you see that you liked the best? The least? What did you learn about giving a good presentation this semester?
- d) You probably learned something about L<sup>A</sup>T<sub>E</sub>X this semester. How did it make your life easier and/or more difficult? Do you think you will use it again in the future?
- e) What are the most memorable moments from class this past semester? If it is memorable, it probably contained a lesson of some kind, and I will probably enjoy reading about it!

Organize your letter in a logical manner.

**Letter to a friend taking the course next semester:** Suppose a friend of yours is taking this course next semester. What advice would you give your friend to insure his/her success with this course? What study habits, writing habits, programming habits helped you the most? Make your advice as specific as possible, and give examples from your experience this semester. Your letter should be at least 400 words long (1 page).

**Writing sample:** Identify and include an excellent piece of mathematical writing you did this semester; alternatively select a piece of writing that posed a substantial challenge to you this semester. You may revise it for your portfolio submission. While you have probably worked with others in producing it, choose something where you did most of the writing and revising. Please do not give me less than one nor more than two pages of material (length not including graphs and tables).

If there are spelling, grammatical, or other errors in your original piece of writing, you must fix them before handing it in here. I will deduct (perhaps a substantial amount of) points for a poorly edited submission.

Reflect on the writing we did this semester, especially this piece, and what it taught you. In your letter to me, tell me what you learned about writing, especially mathematical and scientific writing this semester. Some questions to get your thoughts started:

- a) What did you do well or poorly in this piece?
- b) If it was difficult to write this, why was that?
- c) What aspects of the writing for this class were familiar or unfamiliar to you?
- d) Who is the audience for this piece of writing? What did you do to tailor the writing for the audience?
- e) Did you make revisions to this piece before including it in your portfolio? How did you revise and why?

**Graphs or code:** Include one of the following two items, but not both.

- a) Select some MATLAB code you feel represents one of your best efforts at using MATLAB in one of our modeling projects. While you may have worked with someone else on writing this MATLAB code, you should be the primary author/architect for the MATLAB .

In your letter to me, reflect on how we used MATLAB this semester. What did you learn about using MATLAB to do and understand mathematics in this course. Why did you pick this code?

- b) Select one to three graphs that you feel represent your best efforts at demonstrating the behavior of a mathematical model.

In your letter to me, reflect on what the graphs represent, and why you chose these graphs. (You may need to explain briefly the mathematical model for which you created the graph.) What did you learn about making and using graphs to explain ideas in this course?

**Grading** You will submit a PDF of your portfolio on eLearning.

1. The letter to Dr. Linhart and the associated samples of work are worth a total of 55 points.
2. The letter to a friend is worth 20 points.
3. Thoughtful choices, insightful reflection, good organization and good writing will gain maximum points.
4. Good spelling and grammar are required for maximum points.
5. You may need to include a bibliography, as you did with your other assignments. Full credit on the questions will require appropriate use of bibliography entries and citations.

**Total: 75 points**