Dr. Conroy's Math 381 homework guidelines and suggestions

General guidelines

1. All writing must be in complete english or mathematical sentences, with proper spelling, punctuation and grammar. English sentences must start with a capital letter. All sentences must end with a period. All mathematics and code must be introduced with explanatory sentences.

2. **All problem writeups must begin with a complete description of the problem.** All homework must be self-contained. If you are solving a problem in the homework, it should be completely clear what that problem is simply by reading your work.

   Write up the assignments as though the assignment was entirely your idea, not an assignment at all, but something you thought to work on and figure out. This will help you write fully and with a good frame of mind.

3. **All mathematics should be written with proper mathematical notation.**

   Do not use asterisks (*) for multiplication. Use dot notation or nothing: $a \cdot b = ab$.

   Use subscripts. Write x_i rather than x_i for example.

   Use sigma notation when writing sums.

   If you are typing, use italics for letters used as variables or representing mathematical symbols. For example, this is standard: "Let a be an element of the set E", while "Let a be an element of the set E" is not as good. (Using italics also helps to distinguish the word "a" from the variable or element "a".)

   The best system for typesetting mathematics is LaTeX. It is a free, incredibly powerful system that makes beautiful mathematics. I strongly recommend you use it. I'd be happy to talk about it if you want help getting started or tips on how to use it.

4. If you write any code to help you solve any of the homework problems in this course, you must include the code (thoroughly commented) with your homework submission. The same is true for all software input and output.

5. Code (even well-commented code) is **never** sufficient: you must explain all methods and give all justification and supporting arguments in complete sentences, outside of any code. All code must be thoroughly commented. **You must include all code.**

   Never start an assignment with code: you must have introductory sentences before all code. For example, after describing the mathematics of an LP you intend to solve, you might write "The following is python code I wrote to create the lpsolve input file to solve the LP described above." Then include the code.

6. Do not handwrite code or any other software input or output. Do not include screenshots or photographs of code/input/output: they do not look good. Code, input and output should be copied and pasted to your text editor.

7. Please do not write in multiple columns. Please just write your work in one column down the page: problem 1, then problem 2 below it, then problem 3 below problem 2, etc. Please present your answers to the problems in order.

8. Please write one sentence maximum per line. This will help me greatly in reading your work.

9. **Do not copy work** from another student (or any other source) and **do not allow your work to be copied**. The work you turn in must be your own, and must not have been shared with other students.

If I see evidence of copying, I will have to bring the matter to the attention of Community Standards and Student Conduct. **If you are unclear what constitutes copying, do not hesitate to speak with me about it**.

10. Often, your first draft of your work may not be adequate. You may need to write a second or third draft. Start on scratch paper and leave time to write up a final draft of your work.

11. You are welcome to send me drafts of your work for me to review. The earlier you send these to me, the more likely it will be that I will be able to give you feedback before the due date. Drafts should be sent to me by email, not turned in on Canvas. It is always best to say specifically what you would like me to look at in your draft.

12. Make use of my office hours - that's why I have them.

More specific guidelines and suggestions

13. All variables must be introduced. Do not just start using a variable in statements in your writing until after you have introduced it. When you introduce a variable, you want to state clearly what it represents (a real number, an integer, a polynomial, etc.) and any properties you are assuming. Here are some examples of ways a variable may be introduced.

    - Suppose n is an even integer.
    - Let x_1 and x_2 be real numbers such that $x_1 < x_2$.
    - Let x be the number of cows in the field, and let y be the number of stars in the heavens.

14. Please don't break expressions across lines like this: $91 = 1+2+3+4+5+6+7+8+9+10+11+12+13$. Please just start a new line:

$$91 = 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 + 11 + 12 + 13.$$

    It makes things much easier to read.

15. Please don't use the words "trivially", "clearly", "obviously", etc. They can (and should) be left out with no loss of clarity.

16. Do not use arrows as logical connectors. If you want to write $A \to B$, you probably mean something like "Since A, B." and so that is what you should write.

17. Do not use symbols for therefore or because (i.e, $\therefore$ or $\because$). Use words.

18. Use the following terms correctly.

    - *e.g.* means *for example* (*exempli gratia* in Latin) and should be followed by a comma.
    - *i.e.* means *that is* or *in other words* (*id est* in Latin) and should be followed by a comma.
    - The words *thus, hence, therefore, so,* and *then* introduce a logical conclusion. The statement that follows one of these words should be a direct consequence of the preceding line of logic; *thus*, *therefore* or *hence* are particularly good indicators that you are at a significant conclusion, while so and $then$ are good for indicating an intermediate conclusion.

The most important guideline

19. If you are ever unsure about anything, ask me about it. Email, discussion board, office hours, before class, in class, after class - just ask.