WRITING STYLE[†]

Since this is an advanced course in mathematics, you are expected to apply more mathematical rigor and demonstrate more mathematical maturity than might have been expected of you in past courses. You should therefore follow these rules to sharpen your mathematical writing skills. Violating these may result in point deductions.

1. Homework should appear on **one side of the sheet only** (not front and back).
2. Homework must be written on loose-leaf paper (not spiral notebook paper) and submitted in a 3-fastener folder with your name written neatly on the front cover. (Use a 3-fastener folder, not a binder.) Sections, pages, and problems should be properly ordered, of course.
3. In the folder, problems from different sections should be separated by a divider or by colored cardstock paper.
4. Long problems should *always* begin on a new page.
5. All steps should be written professionally, neatly, and logically. All work must be legible and solutions should proceed logically and clearly **down the page** (not across the page). Sloppy handwriting will result in point loss. (Your instructor should not have to struggle to read your writing or understand your steps.)
6. Drawings should look neat—use rulers and compasses. The use of graph paper is not required but will help.
7. Since this course requires proofs and sometimes abstract ideas, you must include sentences to explain your steps. Also assign numbers to key equations in your work and refer to them by number. For examples:
   - "We plug this result for Q into Eq. (3) to obtain..."
   - "We solve Eqs. (4) and (7) for u and r to obtain..."
   - "We use Maple (included) to solve Eqs. (8,12,14) for u, T, and P to obtain..."
   - "Starting from Eq. (2.7) on page 89 of the text, we have..."

   Notice that in scientific literature, it is inappropriate to use the personal pronoun "I"; instead, "we" should be used.
8. All steps should be shown for full credit. Many students believe that the ability to skip steps impresses the instructor. On the contrary, detailed, thorough, and systematically written steps impress most instructors. Remember that it is your responsibility to demonstrate mastery of the material to the instructor. (It is not the instructor's responsibility to mentally fill in your missing steps. Also, the instructor should not have to assume that you know how to get from one step to the next in your write-up.)
9. Correct mathematical notation must be used at all times. This includes but is not limited to:
   (a) proper use of the equal ($=$) sign,
   (b) proper use of the "implies" symbol $\Longrightarrow$,
   (c) proper use of derivative notation (see example below).
10. Always circle your final answer to each problem.
11. When units are involved, all quantities (not just the final result) should include proper units.

Example: If function f depends explicitly on t, x, y, and z while x, y, and z depend explicitly on t[‡], then the **partial derivative** of f with respect to t is simply

$$\frac{\partial f}{\partial t}, \tag{1}$$

whereas the **total derivative** of f with respect to t is

$$\frac{df}{dt} = \frac{\partial f}{\partial t} + \frac{\partial f}{\partial x}\cdot\frac{dx}{dt} + \frac{\partial f}{\partial y}\cdot\frac{dy}{dt} + \frac{\partial f}{\partial z}\cdot\frac{dz}{dt}\,. \tag{2}$$

There's a BIG difference between (1) and (2). Main point: use d for a total derivative and ∂ for a partial derivative.

[†]The best way to accomplish this is to work each problem first on scratch paper. Once you have solved the problem, on new loose-leaf paper do the write-up you will submit so that your steps and drawings are neat, understandable, and flow logically.

[‡]In this case we write $f = f(t, x(t), y(t), z(t))$.