University of Portland
Donald P. Shiley School of Engineering
Standard Engineering Problem Solving (Homework) Format

***"We are what we repeatedly do. Excellence, then, is not an act, but a habit."* - Aristotle**

Purpose of this Format

Calculations performed by engineers become permanent records that substantiate their decisions. As such, **it is essential that an engineer's written work be clear and understandable**. It is critical that engineering students develop a habit of communicating work effectively. By following the format described below in assignments, design work, and other technical works, students will **learn the *habit* of producing professional quality documentation.** It is critical that students develop a habit of *always* using this format; therefore, homework not following this format will be penalized appropriately.

- Homework should be on 8.5" x 11" paper. The writing should be neat and legible. All pages must be placed in order and stapled.
- If using engineering paper, write on only one side of the paper.
- Pages must be stapled together in the upper left-hand corner.
- Your name, course number, course title, assigned problem numbers, submission date, and page number must be at the top of first page. Your initials and page number must be at the top on all subsequent pages.
- Problem format: Each problem must include the following:
  1. ***Purpose***: A brief sentence describing the purpose of the problem (explains why the analysis is being conducted). Example: "*Determine the location and magnitude of the maximum stress in the beam to assist with material selection.*"
  2. ***Given***: Brief description of all information provided in problem statement. **Use neat sketches, schematics and free body diagrams** as appropriate.
  3. ***Assumptions***: If any assumptions are made, clearly indicate them and if none are made, state so. This is your opportunity to explain the limitations of any analysis you conduct. Explain what conditions are required for the analysis to be valid. **Never** just plug numbers into an equation, you must understand the limitations of the equation! Stating assumptions communicates those limitations.
  4. ***Solution***: Show all details of calculations **including variables! Every step of the solution must include units** (never numbers by themselves)**!** Cite equation numbers used (unless otherwise stated, it will be assumed equation numbers are from the course textbook). Example, show the equation with variables (and equation citation), then numbers with units, then the answer: $F = m*a = 5kg*9.8m/s^2 = \underline{49N}$ eqn. 1-1; Hibbeler.
  5. ***Final Answer***: Underline the final answer. It must include proper units, correct number of significant figures, and the quantities calculated.
  6. ***Explain the answer***: a brief explanation of the significance of the answer is often appropriate. Is it reasonable? Does it answer the question posed in the purpose statement? Example: *The maximum stress of 160ksi occurs at the middle of the beam. This is higher than the yield strength of many materials.*