This is a non-collaborative take-home exam. Submit your own work.

Please read the following statement:

Article II, Section 1 of the University of Idaho Student Code of Conduct states,

Cheating on classroom or outside assignments, examinations, or tests is a violation of this code. Plagiarism, falsification of academic records, and the acquisition or use of test materials without faculty authorization are considered forms of academic dishonesty and, as such, are violations of this code. Because academic honesty and integrity are core values at a university, the faculty finds that even one incident of academic dishonesty seriously and critically endangers the essential operation of the university and may merit expulsion.

I have read and understand the above statement.

_____   _____

Signature   Date

_____

Printed Name   (25 points)

EXAM INSTRUCTIONS – PLEASE READ THIS CAREFULLY

You will have several days to complete this exam. You may use your notes, the online course resources, your computer (EES, Google, etc.) and pretty much any non-human resource you can find. You are not allowed to collaborate with other students/engineers on the exam. However, if you have a strong need to collaborate with others on this exam, you may discuss the exam at great lengths with anyone currently pursuing a humanities degree at the UI.

There will not be partial credit for the questions on this exam. Either you get the answer (within reasonable rounding error), or you don't. Take your time. Validate your answers with some back-of-the-envelope calculations. Make sure your answers make sense.

This is a 100 point exam

You have saturated liquid water in a sealed container that starts at T_1 = 75 °F. The fluid is expanded isothermally (by a combination of heat and moving boundary work) until it becomes a saturated vapor. Use EES to do the following:

1) (25 points) For the given start and end points:
   a. Keep track of the following variables at States 1 and 2: T, p, x, *v*, and u.
   b. Calculate q_{12} (the net specific heat transfer for process 1-2) [Btu/lbm].
   c. Calculate w_{12} (the net specific work for process 1-2) [Btu/lbm]
2) (25 points) Create a Parametric Table that explores values of x_2 from 0.1 to 1.0 (even spacing over 10 runs).
   a. Your parametric table should include columns of:
      x_2 (your input column), T_2, p_2, v_2, u_2, q_12, and w_12.
3) (25 points) Create a p-v property plot for water.
   a. On that plot, overlay the data from your parametric table (making sure to choose appropriate variables to plot).