Shell and Tube Heat Exchanger Problem Statement

Design a Shell & Tube Heat Exchanger (stripped Heavy Naphtha Trim cooler) to cool the heavy naphtha stream of

2 + 0.05*(Group Number - 21) kg/s

at 85 + 0.5*(Group Number - 21) C

to 55 C using water at 30 C as the coolant.

Expectations from the design project:

The design tolerance for the overall heat transfer coefficient should be max. 5%
The tube side pressure drop should be less than 10 psi.
The overdesigned area tolerance should not be beyond 10%.

#1. Process design calculations:
Iterations for the overall heat transfer coefficient by hand calculations, to get a converged solution.

#2 Computer code / web app / GUI tool:
Each group needs to prepare such a code to give the output of all the process design parameters, as calculated from the hand calculation in the report. The typical user input can be considered as the problem statement.

#3 Design of the HE components: Shell cover, channel cover, flange, tube-sheet, baffles, pass partition plate, support, tube layout in the tube sheet

#4 Design drawings: All drawings should follow engineering drawing guidelines
MUST BE DRAWN TO SCALE (in A4 or A3 sheet) General HE layout (side view), Tube-sheet layout (cross-section view), Head, Flange.