

NOTE: Use engineering format for problems 1-3, and use non-engineering format for problems 4-7. This is an individual assignment.

1. Assume that a cylindrical tank with an internal diameter of 3cm and a water depth of 4cm contains salt water with a concentration of 0.10% NaCl by weight. You would like to add the correct amount of 1% NaCl to bring the concentration to 0.15% NaCl. However, when you add a certain mass of salt water, an equal mass of water leaves the system through an overflow. If 20% of the overflow is 1% NaCl and the rest is 0.10% NaCl, then what is the amount of 1% NaCl salt water that you should add to your system? $m=1.96g$
2. Maple syrup, consisting of 34% water and 66% sugar by weight, is created by boiling sap (97% water and 3% sugar) to force water in the sap to evaporate. If the bottling plant can process 1500 kg of sap per hour, how much water must be evaporated per hour, and how much syrup will result?
 $water=1431.8kg/hr$ & $syrup=68.2kg/hr$
3. An industrial engineer at a paper plant oversees the paper making process. She is currently conducting an efficiency analysis on the dryer section of the process. The paper entering the dryer contains 70% water (by weight), and the finished paper that leaves the dryer section contains 5% water. If 1200 lbs/min of water is removed through evaporation in the dryer section, find
 - a. the rate (lbs/min) that finished paper is wound up on the take-up reel (next phase of the paper making process). $553.8lb/min$
 - b. the rate (lbs/min) that paper is entering the dryer $1753.8lb/min$
4. Work with your group to finish the salinity control program from class. Each individual should include the sketch and a screen shot of the serial monitor, printing out when you are entering and leaving various functions as well as all variables and calculated values. Be sure to identify variables as they are printed. Bring your working system to class.
5. Print out the final system evaluation form on the downloads page under Class 14. Fill out the first page of information for your fishtank system. You do not have to fill out the sections on deadtime compensation and gain (we will discuss these next class).
6. Using the Internet and any other sources, learn about the world's supply of non-renewable energy (oil, gas, coal, other). Consider implications of your findings on environmental sustainability, quality of life, the economy and the engineering profession. Write a paragraph in your own words describing what you have learned; be thinking about how the topic of energy could impact your career. We expect you to spend about half an hour completing this problem; this is not meant to be an exhaustive study of the topic.
7. You will be advised in an upcoming ENGR 121 class (either Class 14 or Class 15). In preparation for advising, please do the following:
 - a. Get a carbon copy advising form (do not print one from online). You can find these forms in the undergraduate studies office.
 - b. Fill out the form to the best of your ability. Please do not come with an empty form. You can always scratch classes out after talking with the advisors. Use the alternates section for potential classes that you could take but are not sure you should take.
 - i. Choose a block schedule from the link called "Engineering Block Schedule" on the page:
<https://coes.latech.edu/students/advising-materials/>
 - ii. Choose other classes to fill your schedule based off of your required curriculum for your given discipline. You can find these curricula at the same link above.
 - iii. Be sure to put all the required information on the form: Subject/Course #/Section #, Call #, Hrs, and Time

Do not turn in the advising form with this homework. Hold the form until the day of advising occurs in your class. For homework, just (indicate using non-engineering) format that you completed the task.