

Unit Operations/Water & Wastewater

THINGS TO KNOW FOR THE FIRST MIDTERM EXAM

OPEN BOOK/OPEN NOTES

1. Be able to calculate total doses of chlorine given information about the chlorine demand and the desired free residual chlorine in mg/L.
2. Be able to identify the most prominent pathogens and the diseases they are associated with (as discussed in the text and notes)
3. Be able to properly use C-t tables to find required Cl residuals.
4. Be able to calculate total amounts of chemicals used given doses and the total flow through the system.
5. Know the acid-base reactions of Fe and Al coagulants and be able to find the correct doses of base to neutralize the excess acidity.
6. Likewise, know how chlorine gas and hypochlorite compounds affect pH and how you would neutralize those effects.
7. Know the general classes of pathogens and some of the properties that affect disinfection/removal methods.
8. Do know the basic rules about units on concentration of compounds in water. For example, know what it means to say something like: “nitrate was 18 mg-N/L” or “phosphate was 2.0 mg-P/L” and how you would convert those to moles/L.
9. Know how to switch among moles, equivalents, and mg/L.
10. Know the differences between plug flow and completely mixed reactor systems.
11. In class we talked about applying design criteria to size a clarifier. If I told you the recommended surface loading rate was $X \text{ m}^3\text{h}^{-1}\text{m}^{-2}$ and gave you the flow to be treated, be able to tell me the surface area of the required clarifier. Be able to do the same thing if in sizing a basin given a criterion for detention time or horizontal velocity.