

What you must know

This document describes the material that you are responsible to know before taking ChE-400. You have learned these topics in previous courses of the ChE curriculum. It is very important that you review these topics in your own. Your success in ChE-400 will depend on how well you know and understand the topics described below.

Recommendation: If for any reason you do not know the material described below very well, you should come see me (make an appointment), and I will be glad to suggest ways how you can improve in the specific topic. **I will not spend class time explaining the material described below.**

Topics that you must know to take ChE-400:

1. Perform material balances (ChE-200)
 - a. Constant volume
 - b. Variable density
 - c. Unsteady state
 - d. Total balance and component balances
2. Perform basic algebraic equations (MATH 263A,B,C,D)
 - a. Basic operations with matrices (add, multiply, subtract, etc)
 - b. Basic operations with fractions (add, multiply, subtract, etc)
3. Basic knowledge in Chemistry
 - a. Basic knowledge in chemical reactions (CHEM 152)
 - i. What reaction rate is
 - ii. Factors that affect reaction rates
 - iii. Meaning of order of reaction
 - b. Use of ideal gas law (CHEM 151 and 153)
 - c. Stoichiometry and Balance a chemical reaction (CHEM 151)
 - d. Solutions (different type of concentration representation), (CHEM 152)
 - e. Chemical equilibrium (CHEM 152)
4. Solve integrals analytically (MATH 263B)
5. Take derivatives analytically, including partial differentiation (MATH 263A and C)
6. Solve differential equations analytically (e.g., direct integration), (MATH 340)
7. Use of Matlab (ChE-101)