Chapter 2
Conversion of Units/Systems of Units (lb-moles vs g-moles, pressure, etc.)
Force Units (lbm vs. lbf, gc, etc.)
Least Squares - Fitting a Straight Line to get slope and intercept
Logarithmic Coordinates
Linearization

Chapter 3
Mass vs. Mole Fractions
Average Molecular Weight
Fluid Pressure and Hydrostatic Head
Manometers, Barometers
Atmospheric (i.e., ambient) Pressure, Absolute Pressure, and Gauge Pressure

Chapter 4
The General Balance Equation (accum = in – out + …)
Transient Material Balances
Steady-State Material Balance Calculations for non-reacting flows
Flowcharts, Scaling, and Using a Basis
Balancing a Process - Degrees of Freedom
Outline of a Procedure for Material Balance Calculations
SS Balances on Multiple-Unit Processes/Recycle and Purge (non-reacting flows)

How to Study
Please study hard before the exam; there is not time to study during the exam!
• Look at the competencies
  Do I know how to do that stuff?
  What kind of problems could be on the exam for each competency?
• Read the text
  • work through the examples in the text (from scratch!)
• Review the homework problems, check answer key – (Did I understand everything?)
• Review Dr. Fletcher’s lecture notes posted on the web and my class notes
• Study the practice exam (available on learning suite)
  • The TA’s have the answer key (caution: study before taking the practice exam!)
• Select problems from the end of chapters and work them
• Pose sample exam problems to other students in the class (What do I think is important?)

Exam Tips
1. Read all questions first
2. Work simple problems quickly (look at point distribution)
3. Set up longer problems (but no numbers)
4. Finish working problems you can (remember partial credit helps a lot)
## Competencies Covered Before Exam 1

<table>
<thead>
<tr>
<th>Level</th>
<th>Usage</th>
<th>Competency Expectation</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>M</td>
<td>Students will be able to use basic engineering units in both SI and AES systems in solving problems, and be able to convert between unit systems by hand.</td>
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<tr>
<td>3</td>
<td>M</td>
<td>Students will be able to solve steady-state, overall material balances for systems which include one or more of the following: recycle, multiple units.</td>
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<tr>
<td>2</td>
<td>M</td>
<td>Students will be able to set up and solve simple transient material balances.</td>
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<tr>
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<td>M</td>
<td>Students will be able to use a degree-of-freedom approach to assist in the solution of material balances.</td>
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<tr>
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<td>M</td>
<td>Students will be able to solve simple fluid statics problems (e.g., manometers, fluid head, etc.)</td>
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<tr>
<td>3</td>
<td>M</td>
<td>Students will be able to use a problem solving strategy to define and solve engineering problems.</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>Students will learn about chemical processes, units, and corresponding equipment</td>
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<tr>
<td>2</td>
<td>M</td>
<td>Students will be introduced to process variables (e.g., P, T, flow rate, conc.) and their measurement.</td>
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I=Introductory, M=Main place where material is presented, P=Programmatic material, R=Review