Learning vs. Cramming

- Do you want a medical doctor who crammed for an exam and then forgot everything within a week?
- Would you go to a car mechanic who got an A on the exam but did not remember much after the class?
- The first test in Thermo is very similar to test 3 in the ChE 273 class, but somehow half the class did poorly!

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Exam 1

- No Class on Friday
  - I will be available during class time by zoom
- 3-hour time limit
  - Penalty of 1 pt per minute
- Closed Book, Closed Notes
- Calculator only (no computers)
- Help Sessions:
  - During office hours for TAs

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My Schedule

Time	M	T	W	Th	F
8:00	Class Prep		Class Prep		Class Prep
9:00	ChE273 214 CTB	Mahsa A.	ChE273 214 CTB		ChE273 214 CTB
10:00					
11:00		Devotional Marriott Center		Graduate Seminar	
12:00			Faculty Mtg	TA Meeting	
1:00					
2:00					
3:00					Danny G.
4:00					

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I want you to be successful!!!

- Please come see me if you need help!!

- I am not an ogre!

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Course Outcomes

- Students will be able to perform unit conversions.
- Students will be able to set up and solve steady-state material balances.
- Students will be able to set up and solve transient mass balances.
- Students will be able to solve simple fluid statics problems.*
- Students will understand and be able to use the extent of reaction in material balances for systems involving chemical reactions.
- Students will be able to make order of magnitude estimates, assess reasonableness of solutions, and select appropriate levels of solution sophistication.
- Students will understand process variables (e.g., P, T, flow rate, conc.) including procedures and equipment for their measurement.
- Students will be able to ensure dimensional consistency when evaluating equations.

*manometers, ρgh problems, g_c to convert lb_f to lb_m

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How Should I Study

- Are you comfortable with each course outcome?
- Principles behind each homework problem
  - Answer keys are on Learning Suite
- Practice Exam (on Learning Suite)
- Studies have shown that re-reading the book does not really help!
  - Class notes posted on web page
- What would YOU put on the exam to cover the competencies?
- Learning Resources, U. Colorado videos

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Tips on Taking Exams

- Get some sleep beforehand!!
- Read all questions first
- Work simple problems quickly
  - Look at point distribution
- Set up longer problems (but no numbers)
- Finish working problems you can
  - Remember partial credit helps a lot

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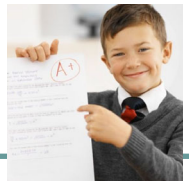
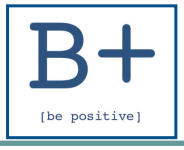
Additional Exam Tips

- Write legibly!!!
- Circle answers!!!
- Make sure you answered everything that was asked!!!
- Make sure you included units in the answer!!!
- Does the answer make sense???





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Practice Exam Results

Problem 1 (Units):	83%
Problem 2 (Transient Balance)	71%
Problem 3 (Multi-unit with Reaction)	87%
Problem 4 (Fluid head/pressure)	81%
Problem 5 (Extent of reaction)	84%
Problem 6 (Combustion/stoichiometry)	83%
Overall Average	83%

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Cautions

- Write out units & cancel them out!
- Manometers → balance pressure on both sides
- Gauge pressure vs. absolute pressure → seems simple
- Head form of the pressure balance?
- Get the signs right on the general balance equation
- Transient balances → what is your comfort level?
- Know how to read & draw a process flow diagram
- Basis → when do I use this?
- DOF → does your method get the right DOF for each unit?

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Note on DOF with air

- If air is coming in, you can either
  A. Use n_{air} as a variable, knowing that $y_{O2} = 0.21$ and $y_{N2} = 0.79$, so one unknown, or
  B. Use n_{O2} and n_{N2} as variables, so two unknowns, but one other equation

$$\frac{n_{N_2}}{n_{O_2}} = \frac{79}{21}$$

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What is wrong with this transient species mole balance?

$$\frac{dy_A}{dt} = \dot{n}_{A,in} - \dot{n}_{A,out}$$

What are the four variables that can go inside the derivative for material balances?

- n, n_A, m, m_A

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