

Fall 2008 Professor Laude

CH 301

INFORMATION PACKET

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COMING TO SEE YOUR PROFESSOR

I know that I am a professor and a dean and old and fat and that all of that may make me seem intimidating. But actually I am very nice to children and students (I am only so-so with small animals). Please do not be afraid to contact me about your academic or non-academic problems with this course. The last thing you need is to end up with a bad grade for this course when there is something that could have been done about it if you had contacted me in time. So just send me an e-mail and I will tell you how easy it is to schedule a private discussion with me.

CH301: A CAPSULE SUMMARY

Course name and number: CH 301: Principles of Chemistry I, Unique number 53755

Class meeting time and location: TTh 2 to 3:15 p.m. in WEL 2.224

Instructor information:

<i>Instructor name</i>	Professor David Laude
<i>Office location</i>	W. C. Hogg 2.222A (W.C. Hogg is between Welch Hall and the Tower)
<i>Office phone</i>	471-6176 (You'll get my assistant Judy)
<i>e-mail</i>	dalaude@mail.utexas.edu
<i>Office hours</i>	Monday through Thursday (see times below) or e-mail for an appointment

Teaching assistant information:

<i>name</i>	<i>e-mail</i>	<i>Principal duty</i>	<i>Office hour</i>	<i>room</i>
Travis Johnson	ubertravis@gmail.com	grading	Tues and Thurs 3:30-5 pm	BIO 301
Yuxuan Wang	yy0712@gmail.com	exams and quizzes	Thursday 11-12 pm	Cubicle B
Michael Gabay	mjgabay@yahoo.com	exams and quizzes	Wednesday 2 to 3 pm	Cubicle B
Daniel Hawkins	dhawkins1234@gmail.com	exams and quizzes	Wednesday 11-12 am	Cubicle B

Where to go for information:

<i>location</i>	<i>information provided</i>
General chemistry office, WEL 2.212	course registration, lost and found, make-up exams
Web: http://courses.cm.utexas.edu/dlaude/	grades, answer key, course notes, handouts

Where to go for help (choose a couple of these to do every week—as of 09/28/08):

<i>day and time</i>	<i>location</i>	<i>activity</i>	<i>presider</i>
Sunday 6:00 to 6:30 pm	Jester Dining	Peer/Peer dinner with TA	Michael
Sunday 6:30 to 7:30 pm	Jester A121A	Discussion section	Michael
Sunday 7:30 to 9:30 pm	Jester dining	Academic community	Michael
Monday 2 to 3 pm	WCH 2.222 or WAG 214	Discussion section	Dr. Laude
Monday 6:30 to 7:00 pm	Kinsolving dining	Peer/Peer dinner with TA	Yuxuan
Monday 7:00 to 8:00 pm.	LLB 103	Discussion section	Yuxuan
Monday 8:00 to 10:00 pm	Kinsolving dining	Academic community	Yuxuan
Tuesday 11:30 am to 12:30 pm	WCH 2.222 or UTC 3.132	Discussion section	Dr. Laude
Tuesday 3:30 to 5 pm	BIO 301	Office hour-grading	Travis
Tuesday 6:30 to 7 pm	Kinsolving dining	Peer/Peer dinner with TA	Travis
Tuesday 7 to 8 pm	LLB 103	Discussion section	Travis
Tuesday 8 to 10 pm	Kinsolving dining	Academic community	Travis
Wednesday 11am to noon	Welch Cubicle B	Discussion section	Daniel
Wednesday 1 to 2 pm	WCH 2.222 or WCH 1.120	Discussion section	Dr. Laude
Wednesday 2 to 3 pm	Welch Cubicle B	Office hour	Michael
Wednesday 6:00 to 6:30 pm.	Jester dining	Peer/Peer dinner with TA	Daniel
Wednesday 6:30 to 7:30 pm.	Jester A218	Discussion section	Daniel
Wednesday 7:30 to 9:30 pm	Jester dining	Academic community	Daniel
Thursday 11 am to noon	Welch Cubicle B	Office hour	Yuxuan
Thursday noon to 1 pm	WCH 2.222 or BEL 328	Discussion section	Dr. Laude
Tuesday 3:30 to 5 pm	BIO 301	Office hour	Travis

CH301 COURSE OUTLINE

Lecture Number	Day	Date	Topic	Worksheet	Quizzes and Exams
	H	8/28	Syllabus, course overview	Worksheet 1	
1	T	9/2	Wave Particle Duality of Light		
2	H	9/4	Development of Quantum Mechanics	Worksheet 2	
3	T	9/9	The Origin of Atomic Orbitals		
4	H	9/11	Electronic Configurations of Atoms and Ions	Worksheet 3	Quiz 1
5	T	9/16	Periodic Trends Explained by ENC		
6	H	9/18	Filled and Half Filled Shell Stability	Worksheet 4	
7	T	9/23	The Chemical Bond: Ionic Bonds		Quiz 2
8	H	9/25	Covalent Lewis Dot Structures	Worksheet 5	
9	T	9/30	More Sophisticated Ideas in Structures		
	W	10/1	Exam 1		Exam 1 on Lectures 1-9
10	H	10/2	Turning 2D into 3D VSEPR Models	Worksheet 6	
11	T	10/7	VB and VSEPR Theory		
12	H	10/9	VB Theory: Making MOs from AOs	Worksheet 7	
13	T	10/14	Molecular Orbital Theory		Quiz 3
14	H	10/16	Ideal Gas Law	Worksheet 8	
15	T	10/21	Advanced Ideas in Gas Theory		
16	H	10/23	Intermolecular Forces	Worksheet 9	Quiz 4
17	T	10/28	Theory Behind IMF		
18	H	10/30	Solids	Worksheet 10	
19	T	11/4	Getting Ready for Thermodynamics		
	W	11/5	Exam 2		Exam 2 on Lectures 10-18
20	H	11/6	Qualitative Thermodynamics	Worksheet 11	
21	T	11/11	Quantitative Thermodynamics		
22	H	11/13	Statistical Thermodynamics	Worksheet 12	Quiz 5
23	T	11/18	Internal Energy and Pies and Ice ream	Worksheet 13	
23	H	11/20	Internal Energy (continued)		
24	T	11/25	Entropy	Worksheet 14	Quiz 6
25	T	12/2	Free Energy		
	W	12/3	Exam 3		Exam 3 on Lectures 19-25
	H	12/11	Final Exam 9 am to noon		Lectures 1-25

GRADING POLICY FOR CH301

Let me make it clear that I view grading as a necessary evil. Personally I'd like to believe you are all here because you can't wait to learn chemistry. Then, after a semester of good solid effort on everyone's part, we'd shake hands and go our separate ways. Maybe a few years from now, you could take some cut-throat exam to see if you knew enough chemistry to go to medical school, and you'd smile as you paused between questions to reminisce about good ol' Dr. Laude: "Gee", you'd think, "I wonder if he's still alive..."

But this isn't the world we've made and consequently I have to have a grading procedure for this class. Here is the general policy:

The grades for the course will be determined by the following rules:

1. Grading will be on a 1000 point scale. Letter grades will then be given on the basis of total points, using the following scale:

900 or more = A; 800-899 = B; 700-799 = C; 600-699 = D; less than 600 = F

2. You may earn your points in the following ways:

- You will take three 180 point evening exams on new material worth a combined total of 540 points;
- You will take a final exam worth 300 points;
- You will take six 40-point quizzes (with the top four scores counting toward a 160 point quiz total.)

NOTE WELL: I give fair quizzes and exams and people who learn the material do very well on them—average grades are in the high 70s. Therefore, do not expect this scale to be lowered--in common terminology, there will be no curve!!!

Look on the next page to find a couple of options in the grading procedure just to spice things up a bit.

Tabulated summary of examinations times and maximum point scores:

<i>Assignment</i>	<i>Date</i>	<i>maximum points</i>
Exam 1	Wednesday, October 1, 7-9 pm	180
Exam 2	Wednesday, November 5, 7-9 pm	180
Exam 3	Wednesday, December 3, 7-9 pm	180
4 best scores out of 6 quizzes	fortnightly	160
Cumulative Final Exam	Thursday, December 11, 9 am to noon	300
Total course points		1000

*****More grading info on the next page*****

DETAILS OF THE INDIVIDUAL COMPONENTS OF THE GRADING PROCEDURE:

EXAMS. Three examinations will be given during the semester on CH301 material. These will be given about once a month at times indicated in the course schedule.. Each examination will consist of 30 six-point multiple choice questions that will be machine graded. These exams will look remarkably like your quizzes and homework sets in format and content.

QUIZZES. Quizzes emphasizing problem solving will be given six times during the semester. The quizzes will occur fortnightly during the last 20 minutes of class. Quizzes will consist of 8 questions worth five points each. The questions will be drawn from the same data bank as the exams and will give you a flavor for what the exams will look like. The quizzes will also offer you the opportunity to keep up with the material so you won't have to cram before exams or the cumulative final. Only your four best of six quizzes will count.

HOMEWORK SETS, WORKSHEETS AND OLD EXAMS. Unlike some of the other CH301 courses, I do not have graded homework—I use in-class quizzes instead. However during the semester I will post on-line a variety of materials to assist in preparing for the quizzes and exams. These materials include recommended problems from each chapter, a variety of work sheets, and the quizzes and exams from previous years.

GRADING OPTIONS IF YOU DIDN'T CARE FOR THE APPROACH DESCRIBED ABOVE:

And now, grading options, because life would be boring if we didn't have the opportunity for a few extra challenges.

OPTION 1 FOR THE HOPELESS OPTIMIST. A grading scheme based on the question, "if I ace the cumulative final can I get an A for the course?" In determining your course grade I will automatically determine whether your score on the final exam is higher than your cumulative average and if it is, I will substitute the exam score. If you score 90% or above on the final, you get an A for the course even if your cumulative course average is below 90%. If you score 80% or above on the final, you get a B for the course even if your cumulative course average is below 80%, etc. This is an excellent option for the student who bombs more than one test, or, believes that he or she has really started to learn the material over the course of the semester but has scores that make an A unattainable. To be eligible for this option, you have to participate in the course by taking at least two of the three exams and at least three of the six quizzes. So don't just wander into the final after a semester in Europe and expect this opportunity.

OPTION 2 FOR THE STUDENT WHO KNOWS TOO MUCH TO BE IN HERE ANYWAY. So you ace the tests and quizzes and really wish you could be home a little earlier for the holidays. Is it possible? Yes. Very simply, if you score 90% (630 out of 700 possible points) on the three exams and four of six quizzes, you will not have to take the final. Each year about 20 to 25% of the class achieves this goal.

MAKE-UP EXAM AND QUIZ PROCEDURE

I will offer make-up exams and quizzes only under the following circumstances:

1. You are away from UT as part of a UT-sponsored activity including athletics and UT-sponsored organizations. Check with me if you are uncertain whether your absence qualifies.
2. The quiz or exam is in conflict with a religious observance—notify me by the 12th class day of the conflict.
3. You suffer from a chronic, documented non-academic illness or emergency that results in your missing multiple exams and quizzes. Under these circumstances you should contact me as soon as possible to discuss a course of action.

If you do miss an exam or quiz for any other reason, the following grading procedure will be implemented:

- Your lowest two quiz grades are dropped, so if you are ill or simply can't make it back from OU weekend on time, I will only count your highest four scores. Bad scores and missed quizzes for good excuses all mean the same to me, they all count toward the two quizzes you can drop.
- If you miss an exam during the semester, it will be replaced by the equivalent percentage of your score on the final exam applied to the 180-point exam scale. For example, if you miss exam two and get a 66% on the final exam, then you will have a score of 120 points (out of 180) inserted for the your exam 2 grade. Note: this substitution will only be allowed for a single exam. There is no need to inform me of your absence. This will happen automatically.

REGISTERING WITH QUEST TO ACCESS YOUR GRADES

The course management system we use to give exams and quizzes is Quest. No doubt you will find yourself using it for other entry level math and science courses as well. If you would like to learn more, go to the link below and enter your utetid. You should automatically see the courses you enroll in that use Quest. If you don't, wait a few days. There is no reason to go there until after your first quiz—from then on it is where you find out your exam and quiz results. The nice thing is that you typically will find out how you did within just a few minutes after you finish.

<http://quest.cns.utexas.edu/student/courses/list>

RANDOM MUSINGS

Once a week I post a Random Musings. This is the way I keep you all aware of what is happening in class—important stuff like what is on the test and why I am not able to stand up straight. Before e-mailing me to ask a question, check the musings that I spend a couple hours writing each week precisely to avoid redundant e-mails. Oh, and there is a poetry corner each week for the culturally disinclined.

A CALENDAR BROUGHT TO YOU BY THE LOWER DIVISION OFFICES

Here are some interesting pieces of information concerning University policy with respect to course registration. If you should find yourself performing more poorly than expected, some of these dates will be important to you.

date	significance
Wednesday, August 27	Classes begin. Department adds and drops for lower division courses will occur in WEL 2.212. Any questions regarding your registration should be brought to this office Monday through Friday between 7:30 am and 4 pm.
Tuesday, September 2	Last day of Official Add/Drop and Late Registration period. Last day to add electronically.
Friday, September 12	Twelfth Class Day. Official enrollment count is taken. Last day to drop a course for possible refund.
Wednesday, September 24	Last day to drop a course without possible academic penalty. (Q drop deadline). In my class I am extending this period by a few days to October 7 so that you can evaluate your results from the first exam.
Wednesday, October 22	Last day an undergraduate may, with Dean's permission, withdraw from the university or drop a course for academic reasons. Last day to change registration in a course between a letter grade and P/F.
Friday, December 5	Last day of classes.
Monday, Tuesday, December 8,9	No class days.
Thursday, December 11, 9 am till noon	Final exam for CH301.

PREREQUISITES FOR CH301

To enroll in this class you must be calculus ready (have completed M305G or equivalent with a grade of C or better.) If you do not meet these requirements the general chemistry office will drop you from the class on the 4th class day. E-mail me if you think there might be complications that need to be cleared up.

Q DROPS

Because I am not giving a major exam until after the 20th class day, I am extending the deadline and will rubber stamp a Q drop through October 7. After October 7 I will assign a Q only if you are: **actually passing the course with a grade of C or better** or have a **substantiated non-academic reason**. In other words, I will be doing my job according to the rules. If you have friends who are able to extract a Q drop on October 7 in another course even with failing grades, that is between your friend and his or her professor.

ELECTRONIC WORLD OF CH301: WEB PAGES

I know longer believe in paper and consequently make everything I do for the course available on the web. Specifically, you will need to go to web sites to find:

- Lecture notes, worksheets and musings
- The grading website
- The text book web site
- Course communication options
- Videos of my lectures

What this means, then, is that you simply have to book mark my course materials and be ready to reference them constantly. The many urls you should use are

My web pages:	http://courses.cm.utexas.edu/dlaude/
Textbook web site:	http://courses.bfwpub.com/chemprin
Quest website:	http://quest.cns.utexas.edu/student/courses/list
Lecture video website:	http://cns.utexas.edu/cns_lectures/

In an effort to simplify all of this, I have captured all of these sites and created a home page on the textbook web site. If you prefer, you can go to <http://courses.bfwpub.com/chemprin> and link to the other sites easily from there.

ELECTRONIC LECTURE NOTES

It pains me to watch students copying furiously during a time they should be trying to understand the material, so I will make my lecture notes from class, typed and organized, available for you to purchase cheap or download from the web.

VIDEOS OF DR. LAUDE'S LECTURES

There are cameras in the room recording my every move so that a video of each of my lectures can be made available to the class. This will be handy for those of you who have to miss a class or want to revisit a difficult concept that I have eloquently explained. I guess it is also a way to take the course without ever leaving your bedroom.

To access the lectures, go to

http://cns.utexas.edu/cns_lectures/

and click on my course. I will give a brief demo in class of how to use the site after the first lecture is recorded.

E-MAIL

There are many ways to communicate with Dr. Laude and the TAs when you have routine questions about course administration and grades. The one that makes us happiest is electronic mail. That way we have a hard copy of our communication. It also frees up office hours for weightier matters. Best of all, we promise a 24 hour turn-around time for your messages. Oh, one thing we do not do by e-mail is answer complicated science questions better suited for the chalk board during any of a dozen help sessions and office hours each week. Please use a little common sense about when to e-mail us.

To contact Dr. Laude, use the following address:
To contact Travis Johnson, use the following address:
To contact Michael Gabay, use the following address:
To contact Yuxuan Wang, use the following address:
To contact Daniel Hawkins, use the following address:

dalaude@mail.utexas.edu
ubertravis@gmail.com
mjgabay@yahoo.com
yy0712@gmail.com
dhawkins1234@gmail.com

SOME TIPS ON E-MAIL ETIQUETTE

Sorry, I can't take it anymore and have to start sounding like your father. You may have noticed there are now two ways of saying the same thing in an e-mail. Note the first form is used in presumptuously cool TV commercials from people trying to sell you small electronic gadgets.

```
I man :::?"  
gimme 5 pt ec @@#?::"))(:HC
```

I know you have your own way of doing e-mail and I am unlikely to change it, but understand that there is a difference between using IM or text messagin with your girl friends and e-mailing your professor with a request. In my old-fashioned opinion, e-mail is no different than a letter, a phone call or an office visit. Each of these forms of communication includes:

- a salutation with appropriate title (for example, I am Professor Laude or Dr. Laude—I am not Mr. Laude or dave or hey loudman:::/) or undeserving of any greeting at all.
- a decent stab at identifying who you are (including your uteid if it is something to do with grades in the class) so that when I e-mail you back I can include my own correct salutation
- a succinct but thorough description of why you e-mailed me.

Also desired but non-essential courtesies include:

- A friendly farewell (like “Have a good weekend” or “Thank you”)
- Punctuation reflecting the possibility you were educated in a school system.

Using these suggestions, an e-mail to me might look like this:

```
Professor Laude,  
I am e-mailing to request an appointment time with you to discuss some non-academic concerns that are making it difficult to  
ace your exams.  
Thanks for the opportunity,  
Harold Carmichael  
hc1234
```

Now I don't particularly care if you want to ignore my suggestions, but there will come a day when your lack of attention to these courtesies will have an undesired consequence, like ignoring your e-mail.

TEXTBOOK AND SUPPLEMENTAL MATERIALS FOR CH301

Text: Welcome to a brave new world of electronic textbooks—I am using Atkins Jones 4th edition electronic, found at <http://courses.bfwpub.com/chemprin>. E-books are cheaper, don't weigh anything, don't kill trees, and the bolded or colorful stuff on the pages actually turns into a video or a link to a useful web site rather than being a text book just wishing it was a web site. Congratulations.

To find out how to purchase the e-book, please use the handout found in the random musings folder on my CH301 web site. Purchase price is \$87.50 (less than half the cost of a new text) and you need to have a credit card ready. A neat feature of the e-book it that it is my personal text book to annotate on line, personalizing it for the entire class. This will be a learning experience for all of us, but it will be worth it.

Course Packet: If you are going to buy one supplement for the course, it makes sense that you buy the one your professor makes. My course packet includes all of the lecture notes, typed up neatly, all of last year's exams and quizzes, all this year's worksheets with answer keys, a nice review of high school chemistry, plus the syllabus. Much of this you could find on the web, but what a hassle. You can purchase this nice little package for \$25 (tax free and half the price the for-profit copy centers would charge) as part of a fundraiser for scholarships for students. There will be a one-time sale of this packet on Thursday, September 4th.

REGRADE PROCEDURE

To request a regrade, download a regrade form from my web site and write down what you want done. Turn it in before or after class or bring it to Travis during his office hours. Make sure you provide adequate information including full name and version number so he has a chance to find an answer to your question. There will be a two-week limit with respect to regrades on quizzes. So if you do not submit a regrade request to Travis in person or by e-mail within two weeks of the quiz date, you get the grade that is recorded. This means it is your responsibility to stay in touch with the grading service.

STUDENTS WITH DISABILITIES

The Services for Students with Disabilities (SSD) office of the Student Dean's Office is charged with assisting disabled students. They estimate that about 2000 students suffer from disabilities including mobility impairments, learning disabilities, visual impairments, hearing impairments, ADD and ADHD, and others. By law, all of these students are guaranteed a learning environment that provides reasonable accommodation of their disability. As an instructor I am required to provide reasonable accommodation for students with disabilities and I am happy to do so. However it is your responsibility to inform me at the beginning of the semester (by the 12th class day) if you have a disability. I must know this information as soon as possible so that I can make appropriate arrangements.

RELIGIOUS OBSERVANCES AND MAKE-UP EXAMS

It is a University policy that a student may make-up work missed due to observance of a religious holiday. Please notify me by the 12th class day to insure that you can make up the exam—a make-up exam will be provided to those who request it.

ACADEMIC COMMUNITIES STUDY GROUPS.

I have arranged for the class to form study group tables four nights a week in the residence hall dining rooms as part of the CNS Academic Communities. The way it works is that there will be TA and peer-to-peer supported study groups on Sunday through Wednesday evenings in the two dining halls. Each of these study group sessions is preceded by a discussion session where you can pick up a copy of worksheets and get questions answered by the TAs.

Academic Community Study Groups Times and Locations:

<i>day and time</i>	<i>location</i>	<i>activity</i>	<i>usual presider</i>
Sunday 6:30 to 7:30 pm.	Jester A121A	Discussion section	Michael
Sunday 7:30 to 9:30 pm	Jester Dining Hall	Academic community	Michael
Monday 7 to 8 pm	LLB 103	Discussion section	Yuxuan
Monday 8 to 10 pm	Kinsolving dining hall	Academic community	Yuxuan
Tuesday 7 to 8 pm	LLB 103	Discussion section	Travis
Tuesday 8 to 10 pm	Kinsolving dining	Academic community	Travis
Wednesday 6:30 to 7:30 pm.	Jester A218	Discussion section	Daniel
Wednesday 7:30 to 9:30 pm	Jester Dining Hall	Academic community	Daniel

THE SUCCESSFUL NATURAL SCIENCES STUDENT

LESSON 1

A FABLE: THE ACTIVE LEARNER AND THE PASSIVE LEARNER

Ziquang the Passive Learner. Ziquang has never missed a lecture. Ziquang goes to two discussion sections a week. Ziquang reads and rereads the chapters in the text. Ziquang has hired a tutor. Ziquang has worked and reworked all of the questions from last year's exams one hundred times. On the day of the test I ask Ziquang if he can name the seven strong acids. He only knows three. Ziquang gets a 65 on the exam.

Indirah the Active Learner. Indirah sleeps until 4 each day and has never come to lecture. Indirah never bought the text book. On the day before the test Indirah gets on the web and finds out what the 30 questions are on the exam. One of them is to name the strong acids. Indirah memorizes all seven acids. She also stays up all night and learns how to answer the other 29 questions. On the day of the test I ask Indirah if she can name the seven strong acids. She does. Indirah gets a 92 on the exam.

The Moral of the Story. The moral is not that you should skip class and stay up all night before the test. The moral is that you have to be able to prove to yourself that you are learning the material that is on the exam. How you do it I don't care. But be aware that there is no guarantee that being a good little boy or girl will get you an A like it did in high school. Learn the material and I will give you an A. Don't and I will be happy to console you before explaining what it means to be an active learner.

LESSON 2

YOU'VE GOT TO KNOW WHAT YOU DON'T KNOW

The wisest thing I ever heard a student say. A young woman was asked by an incoming freshman what it took to be successful at UT. She replied, "you have to know what you don't know."

Imagine sitting down by yourself just before an exam and seeing how much stuff about the test you can actually write down, or say out loud, with nothing in your possession but your brain. After all, on the exam that giant back pack of material and that computer and those friends you studied with you will be of no help at all. Don't fool yourself that just because you studied hard (whatever that means), that you are prepared for the exam.

Moral of the Story? The only way you can know for certain that you will do well on the exam is if you can isolate yourself from your learning environment and really assess what you know, and what you don't know. In that quiet time, if you can spend an hour explaining to yourself what will be on the exam, and you never have to hesitate, or can always find vocabulary (other than the word "thingy") to express yourself, then you will do fine on the exam. And if you can't? You are just kidding yourself that you are prepared. Oh, and if you don't want to know the truth, and you walk into the exam having never really queried yourself about what you know and don't know, you are simply gambling with your grade.

LESSON 3

ACHIEVING PERFECTION IS HOW YOU EARN AN A IN COLLEGE

High school was great. You glanced over the material on the study guide for a 20 question test, and then you took the exam. You "kind of" or "sort of" knew the material. And your teacher was just thankful you were coming to class and weren't a jerk. So when it came time to grade the exam, even though you actually only got 10 questions right, for the 10 questions you got wrong, you "almost" got them right and with four points of partial credit on each question, you received your A for the test and a ticket to UT. Congratulations.

College is not so great. It seems like half your exams are multiple-choice. And after studying for your 20-question exam, you "kind of" or "sort of" know the material. Oh, this time your professor doesn't care if you studied enough. She just wants to know that you learned it. So you take a multiple choice test and get 10 questions right, and for ten other questions, that you "kind of" or "sort of" know, you find a really good answer

that happens to be almost right. For all that effort spent almost learning, you get a zero on the question, an F for the test, and a conversation with your parents about alternate career choices. Welcome to college.

Moral of the story? You need to tweak that calibration curve on what it means to know what you know. College demands a lot more.

LESSON 4

THERE ARE DOZENS OF RESOURCES FOR LEARNING THE MATERIAL—FIND THE RIGHT ONES FOR YOU

You will want to identify an efficient and effective approach to getting an A in a course. Understand that learning to study successfully at the college level is an ongoing effort and that if you find yourself performing poorly, then this is an indication that you need to change—it is up to you to figure out which approaches works best and constantly be refining your strategies for learning.

Listed below are examples of the many resources typically available for the science and math courses you will take at UT. Mix and match them to come up with what makes you a successful student.

Lecture. From a testing perspective, the most important thing about going to class is **finding out what you are expected to learn to get a good grade** (and that is the reason you should always go to class.) It is a perk if the professor is also a dazzling lecturer who can really teach you something you will remember during a 50 or 75 minute time period. So just because you come to class daily and then nod off, or day dream, or act like a stenographer copying off the board, doesn't mean you have helped yourself at all in preparation for an exam. In many ways, the lecture is the least important thing you will do in terms of active learning.

Lectures on Demand. Increasingly faculty are posting their lectures on line for you to download and watch. This can become a more effective way to view lectures than the real-time version since you will be able to pick and choose exactly what you need to hear. For my course you can find the videos at http://cns.utexas.edu/cns_lectures/

Lecture Notes. Regardless of whether you go to class, someone has created some really good course notes. Maybe it is the professor. Maybe it is a classmate. Maybe it is you who was a really good stenographer. Whoever did the work, get a hold of these notes and to the best of your ability, know them thoroughly—don't just look at them, **KNOW THEM**. As a test, put them away and see how well you can recreate them from memory. After all, they are what the professor thought was important and they will be 99% of any exam.

Discussion sections, office hours, study groups. Everyone needs a secondary learning environment where they can go to have questions answered and, in general, engage in intellectual discussion about the subject matter. Make sure you provide yourself this opportunity by finding yourself a discussion section, office hour or study group each week that fits your schedule and going every week. By the way, there is no more wasted time than time spent in a discussion section or study group unprepared, so go in knowing what it is you want to learn and ready to be an active learner.

Academic Communities Study Groups. Study group tables form five nights a week in the residence hall dining rooms as part of the CNS Academic Communities. For more information on how to use these communities to help you with all of your math and science classes, please check out the Academic Communities website: http://cns.utexas.edu/students/academic_community_programs/.

Worksheets and problem sets. Most every science or math course provides students with supplemental problems and worksheets to help you master the material. Of course you should do these problems, but appreciate that working them with a friend, or with an answer key, really reduces the likelihood you will be able

to do the problems by yourself on an exam. Don't fool yourself by reworking the same problems multiple times!!

Textbooks. Your textbook provides an eloquent description of the course material—actually wayyyy too eloquent of a description. Understand two things about textbooks: they always have more material in them than your instructor wants you to know and there are a dozens of other textbooks in the library that you might find to be a better learning resource. Don't be afraid to use a different book.

Textbook problems. There are plenty of problems in textbooks to work. Since these questions approximate the content and difficulty of exam questions (albeit in a different format), they are a useful way to study and test your knowledge, but unless actually assigned by the professor, they might not approximate what you will be asked to learn for an exam.

Textbook support materials. You can purchase supplemental materials with most every textbook, such as answer keys and textbook outlines and study guides. You can also use the CDs provided with the text to engage you in computer-assisted exercises to test whether you have learned the material. However unless you are independently wealthy I rarely see the reason to make these purchases when you have the internet available to do the same thing.

Internet. Type any topic area you want into a search engine and you will retrieve about 4.6 million web sites that are constructed to assist with your education. One site to absolutely book mark is the one associated with your text book. In most cases it offers an array of materials from outlines to sample problems to multimedia downloads that can be more useful and easier to navigate than the text itself. And if you find another site on the web that teaches you better, bookmark it as well.

Write your own problems. Be an active learner. If you can learn to write your own questions, then you will really know that you have learned the material. It is actually not that hard once you put yourself in the position of thinking about what should go into a question. This is the number one way you will know that you know the material.

A thought on tutoring. Some people think they can buy a grade. So they shell out \$30 an hour to observe someone else prove they know the material. You've already heard your professor give a lecture on the subject that is a lot better than the tutor, and you can go (for free) to scores of discussion sections and study groups. So the only real reason to pay a tutor is to have someone act like your mom or dad and force you to sit in your room and study. So pay your roommate \$10 an hour to do the same and save.

So should you use all of these resources? Of course not. So which should you use? The ones that get you an A the faster and cheapest. Which ones are those? How do I know? Everyone is different—figure out what works for you and do it. But always be ready to change because just about the time you figure out how to ace one course, you will have another course that requires a different form of studying to be successful.