

**CHEMISTRY 305**  
**ChemBridge**  
**Spring 2012**

**Lecturer:** Dr. Cynthia LaBrake

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**Virtual Office Hours:** by Adobe Connect by appointment

**Textbook:** *Chemistry in Context*, 7<sup>h</sup> Edition, Eubanks, et al

**Materials:** 1.5 in 3 ring binder; nonprogrammable scientific calculator

**Grading:** Course grades will be determined according to the following scale:

A	93.00 → 100
A-	90.00 → 92.99
B+	87.00 → 89.99
B	83.00 → 86.99
B-	80.00 → 82.99
C+	77.00 → 79.99
C	73.00 → 76.99
C-	70.00 → 72.99
D+	67.00 → 69.99
D	63.00 → 66.99
D-	60.00 → 62.99
F	less than 60.00

**Requirements:**

Homework:	10% ( <i>lowest grade will be dropped</i> )
Quizzes:	10% ( <i>lowest grade will be dropped</i> )
Learning Modules:	10% ( <i>many modules, completion graded</i> )
Exams:	50% ( <i>4 exams, lowest grade will be dropped**</i> )
Final:	20% ( <i>1 cumulative and mandatory</i> )

\*\* If you are completing Unit 5-8, if you are doing 6-8 then you might have the opportunity to do an optional Nutrition Report for the 4<sup>th</sup> test grade.

**Attendance:** Attendance is required. Your teacher will assign your high school grade in part based on your attendance and your participation. A lot of the work for this course will also need to be done outside of class. Most of the work will require a computer with Internet access, if you do not have this at home, investigate your local library or school library/computer lab. You will need to be in class to take your quizzes and exams, as your teacher will proctor them.

**Learning Modules:** The course material will be metered out in the form of Learning Modules which are posted in the Quest Assessment system: <http://quest.cns.utexas.edu>. Some Learning Modules consist of a series of short videos followed by questions, others contain an activity packet to be worked in small groups and validated by your teacher, and some are some combination of these extremes. You will be graded on the completion of the modules. It is important to keep up the pace and work your way through the modules according to the Unit schedule, which will be provided to you by your teacher. If you are absent you have to make sure you make up the modules on your own time and catch up with the class.

**Homework:** Homework will be assigned for each unit. This homework will be web based on the Quest system. The URL for this homework system is: <http://quest.cns.utexas.edu>. New homework assignments will be posted regularly, typically 2 per unit. A deadline for submission of the answers will be given. To receive credit, you must enter your answers before the due date deadline. This homework will count toward 10% of your final college grade, so it is important to get the homework turned in by the deadline. Please work all homework neatly and keep in chronological order in a chemistry homework notebook and bring the notebook to class with you daily. It is your **awesome** responsibility to do the homework and then check your answers. If, *after* checking the answers, you do not understand how to do the homework, it is your responsibility to see your instructor or email me and **ask questions!** If you do not do the homework, you will not know what you do or do not understand. Simply memorizing the notes will not lead to success in this class! **PLEASE ASK QUESTIONS!**

**Quizzes:** Two quizzes per unit will be given in class for units 5,6,&7 and three for Unit 8, for a total of nine quizzes. The lowest grade will be dropped, and then the remainder of the grades will be averaged counting towards 10% of your final grade. If you miss a quiz and do not have an excused absence, that quiz grade will be a 0. There are no make up quizzes for unexcused absences.

**Examinations:** At the completion of each Unit you will take a Unit Exam. All exams will be given during the scheduled class times, which are left to the discretion of your high school teacher. If you miss an exam, ***without an excused absence***, it will be counted as 0.

**Dishonesty:** Dishonesty (cheating) of any form on an exam, quiz or project will not be tolerated. The penalty for being caught is a **ZERO** for that exam or quiz.

***The instructor of this course reserves the right to alter at any time any of the information presented on this syllabus at her discretion. If you are not in class, you may miss important information that directly affects your grade in chemistry!***

**ChemBridge: Chemistry 305 Spring 2012**  
**(Week 1 begins on January 30<sup>th</sup>)**

<b>Lecture</b>	<b>Text Section</b>	<b>Topics</b>
<b>Unit 5</b> <i>Weeks 1 – 2</i>	<b>CH 4</b>	Energy, Heat, Measuring Energy Changes Reaction Stoichiometry Energy Changes at the Molecular Level The Need for Fuel, Coal Petroleum & Gasoline Alternative Fuels and Energy Conservation
<b>Unit 6</b> <i>Weeks 3 - 5</i>	<b>CH 8</b>	Electron Transfer – Oxidation Numbers Identify Oxidation/Reduction Reactions Battery versus Cell Galvanic Cell – Technology vs Science Fuel Cells Solar Energy Photovoltaic Cells Electric Cars <b>EXAM 6</b>
<b>Unit 7</b> <i>Weeks 6 - 8</i>	<b>CH 5</b>	Water - Sources Water – Pure Substance or Mixture? Intermolecular Forces Water is Unique Review Ionic Compounds Aqueous Solutions and Intermolecular Forces Water Pollution Water Quality Tap, Bottled or Filtered? <b>EXAM 7</b>
<b>Unit 8</b> <i>Weeks 9 - 12</i>	<b>CH 9/10</b>	Organic Chemistry Functional Groups Basic Nomenclature and Reactions Polymers Structure/Function Recycling Drugs Structure/Function Good Drugs vs Bad Drugs <b>EXAM 8</b>
<b>Week 13 (April 23<sup>rd</sup>)</b> <b>Week 14 (April 30<sup>th</sup>)</b>		<b>Review Week</b> <b>Final Exam Week</b>

## UNIT 5 Schedule - Spring 2012 - CH 305 - LaBrake

**Suggested Schedule.** This 2-week unit will cover Chapter 4 in the Chemistry in Context Book.

### Week 1: GOAL: Conservation of Energy, Energy Units, Stoichiometry

45 min	Lecture/Activity	Quest	7 <sup>th</sup> Ed	Teacher Notes
1	<p><b>U5-LM01</b> – Reaction Stoichiometry Mol-Mol (2 short videos, total 7 min + a couple questions)</p> <p><b>U5-LM02</b> – Reaction Stoichiometry g-g and limiting (6 short videos, total 20 min + some questions)</p>	Post U5-HW 1		This might need to spill over into next day. At least if they get through all the video, that is a good start. They are going to have to work hard and stay focused.
2	<b>U5-LM03</b> – Thermochemistry (2 short videos – 4 mins + question)		Read 4.1-4.2,	More of the same, except add calculating energy, there will be extra time so work on associated problems from HW 9
3	<p><b>U5-LM04</b> – Energy Transfer (2 short videos – 10 min + questions)</p> <p><b>LM5</b> Energy Transfer ( 2 short videos – 5 min + questions)</p>			These LM are good for HW, saving class time to work on the Quest HW9 in class.
4	<b>U5-LM06 – Calorimetry POGIL</b>		Read 4.3 – 4.4	If your students are struggling with stoichiometry, you can just talk about calorimetry for about 15 and use your time to work HW, etc, rather than doing this exercise
5	<b>U5-LM07</b> – Calorimetry – ( 2 short videos totaling 13 min + questions)	U5 -Quiz 1		It's important for the students to recognize that the heat energy given off can be measured using standard techniques

**Week 2: GOAL: Solid and Liquid mixtures and separation techniques, Problems with Fossil fuels & Alternative Energy**

<b>45 min</b>	<b>Lecture/Activity</b>	<b>Quest</b>	<b>7<sup>th</sup> Ed</b>	<b>Teacher Notes</b>
<b>1</b>	<b>U5-LM08</b> – Heats of Reaction from Bond Energy Calculations (4 short videos – 18 min total + questions)	Post U5 HW 2	Read 4.5-4.6	The students might need some extra teacher facilitation, as this is a skill that might be confusing
<b>2</b>	<b>U5-LM09</b> – Fossil Fuels – Coal (2 videos – 14 min total + questions) <b>U5-LM10</b> – Fossil Fuels – Petroleum ( 4 videos – 25 min total + questions)		Read 4.7-4.9	They might have to finish this as HW. Or, they could just read in the book and answer the questions in the LMs, information in videos is directly from book. You could assign the book reading as HW and just answer questions in class. This would leave some extra time for working on HW 10 in class.
<b>3</b>	<b>U5-LM11</b> – Alternative Fuels (2 videos – total 18 min + questions)		Read 4.10-4.11	
<b>4</b>	<b>U5-LM12</b> – Review (short video only 4 min)	U5 Quiz 2		Use the rest of class time to finish up HW and take last quiz.
<b>5</b>		U5 Exam 5		

## UNIT 6 SCHEDULE - Spring 2012 - CH 305 - LaBrake

**Suggested Schedule:** Five 40-45 minute sessions per week. POGIL is considered active learning. This 3-week unit will cover Chapter 8 in the Chemistry in Context Book.

**Week 1: GOAL: Awareness of electron transfer, oxidation numbers & basic redox reactions**

45 min	Lecture/Activity	Quest	7 <sup>th</sup> Ed	Teacher Notes
1	<b>U6 LM01 – Electron Transfer (6 min video, 4 min video + questions)</b>	Post HW 1	Read 8.1	Learn how to assign oxidation numbers
2	<b>U6 LM02 - POGIL Redox Reactions</b>			If not enough class time, finish this as HW
3	<b>U6 LM03 – Identifying Redox Processes (9 min of video + questions)</b>			
4	<b>U6 LM04 – Balancing Redox Rxns (10 min video + questions)</b>			
5	<b>U6 LM05 – Intro to Voltaic Cells POGIL</b> <b>U6 LM06 – Assign as HW (13 min of video + questions, review of POGIL)</b>	Quiz 1	Read 8.2-8.4	Finish as HW

**Week 2: GOAL: Voltaic Cells, Batteries, Fuel Cells and Applications**

45 min	Lecture/Activity	Quest	7 <sup>th</sup> Ed	Teacher Notes
1	<b>U6 LM07 Anatomy of a Voltaic Cell (10 min video, question, short worksheet)</b>	Post HW 2		The students are asked at the end to try to sketch a voltaic cell, then submit an answer that they completed the task
2	<b>U6 LM08 Batteries (about 20 min of video + questions)</b>		Read 8.5-8.8	This LM could be assigned as HW if you want to use class time to work no HW2

3	<b>U6 LM09 – Fuel Cells (15 min of video + questions)</b>			
4	<b>U6 LM10 – Hydrogen for Energy (10 min video + questions)</b>			
5	<b>Flex Time – If you want to set up a voltaic or an electrolytic cell similar to Exp 22 (Can we get electricity from Chemical Reactions) in the CIC Lab Book, do the POGIL “I’ve got power, The voltaic Cell” or have the kids do independent research and share on modern battery technology, it’s up to you.</b>	Quiz 2		

**Week 3: GOAL: Photovoltaic Cells & Solar Energy**

<b>45 min</b>	<b>Lecture/Activity</b>	<b>Quest</b>	<b>7<sup>th</sup> Ed</b>	<b>Teacher Notes</b>
1	<b>U6 LM11 – Photochemical Cells (18 min of video + questions)</b>		Read: 8.9	Can be assigned as HW if you want class time for working HW2
2	<b>U6 LM12 – Pros &amp; Cons of Photovoltaics (9 min video + questions)</b>	Finish up all assigned Quest HW.	Read: 8.10	Can be assigned as HW, if you want class time to work on HW2
3	<b>U6 LM13 – Unit 6 Review (5 min video) + review worksheet</b>	All Quest assignments should be submitted by this day		
4	Homework help and catch up day.			
5	<b>U6-Exam 6</b>			

## UNIT 7 – SCHEDULE- Spring 2012 - CH 305 - LaBrake

**Suggested Schedule:** This 3-week unit will cover Chapter 5 in the Chemistry in Context Book.

### Unit 7 Week 1: GOAL: Concentration Calculations & Concept, Start IMF

45 min	Lecture/Activity	Quest	7 <sup>th</sup> Ed	Teacher Notes
1	<p><b>Unit7LM01 (2 min video, download and read articles, answer questions)</b>  <a href="http://www.cbsnews.com/stories/2010/04/29/scitech/main6444437.shtml">http://www.cbsnews.com/stories/2010/04/29/scitech/main6444437.shtml</a></p> <p><a href="http://astrobiology.nasa.gov/ask-an-astrobiologist/question/?id=56">http://astrobiology.nasa.gov/ask-an-astrobiologist/question/?id=56</a></p> <p><a href="http://science.howstuffworks.com/search.php?terms=where+did+water+come+from%3F">http://science.howstuffworks.com/search.php?terms=where+did+water+come+from%3F</a></p> <p><b>Unit7LM02</b> – do for HW – surface water vs underground water  <b>Unit7LM03</b> – introduction to solutions, different concentration units, simple review from HS chemistry (20 min of video with 4 easy questions) do for HW</p>		Read 5.4	
2	<b>Unit7LM04 - POGIL – Molarity</b>	Post U7HW1		Finish as HW if not finished in class
3	<p><b>Unit7LM05</b> Concentration Calculations (molarity)  <b>Video – 8 min</b>  <b>Follow on from POGIL activity</b></p>		Read 5.5	
4	<b>Unit7LM06</b> Identify covalent and ionic bonds (2 short videos totaling 13 min with questions)		Read 5.1-5.2	
5	<b>Unit7LM07</b> – identifying polar molecules (6 min video plus short worksheet, should be done in class)	U7Quiz1		



**Unit 7 Week 2: GOAL: IMF, Water as a Solvent**

<b>45 min</b>	<b>Lecture/Activity</b>	<b>Quest</b>	<b>7<sup>th</sup> Ed</b>	<b>Teacher Notes</b>
<b>1</b>	<b>Unit7LM08</b> – Electrostatic Forces (2 short videos totally 8 min) <b>Unit7LM09</b> – Types of IMFs (4 video segments totally 20 min, with questions)		Read 5.5	Whatever is not finished in class can be assigned for HW.
<b>2</b>	<b>Unit7LM10</b> Exploring Liquids and Uncovering IMFs – group activity facilitated by teacher			This activity needs to be facilitated
<b>3</b>	<b>Unit7LM10</b> - continued	Post U7HW2		
<b>4</b>	<b>Unit7LM11 Solutions</b> – electrolytic and nonelectrolytic and like dissolves like (4 short video segments totaling 18 min, plus some questions)		Read 5.6	
<b>5</b>	<b>Unit7LM12</b> (4 min video, plus read article on “Why Oceans are Salty”, complete short worksheet		Read 5.8-5.9	If run out of time, finish worksheet as HW

**Unit 7 Week 3: GOAL: The business of water – providing clean and safe drinking water.**

<b>45 min</b>	<b>Lecture/Activity</b>	<b>Quest</b>	<b>7<sup>th</sup> Ed</b>	<b>Teacher Notes</b>
<b>1</b>	<b>Flex time, HW help</b>	U7Quiz2		
<b>2</b>	<b>Unit7LM13</b> (4 short video segments, total ~25 min video + questions)		Read: 5.10-5.12	
<b>3</b>	<b>Unit7LM14</b> (short 4 min review video)			
<b>4</b>	Homework help and catch up day.	All Quest assignments for this unit should be completed by this day.		
<b>5</b>	<b>U7Exam</b>			

## UNIT 8 – SCHEDULE - Spring 2012 - CH 305 - LaBrake

**Suggested Schedule:** Five 40-45 minute sessions per week.

This 4-week unit will cover Chapters 9 & 10 in the Chemistry in Context Book.

### Unit 8 Week 1: GOAL: Learn some basic Organic Chemistry – Nomenclature & Basic Reactions

45 min	Lecture/Activity	Quest	7 <sup>th</sup> Ed	Teacher Notes
1	<b>Unit8LM01</b> Introduction – Basic Organic Chemistry uncover the world of Plastics and Drugs ( <b>8 min video</b> ) <b>POGIL</b> – Molecular Representations & Alkane Nomenclature (Hanson Book)	Post U8-HW1		This is a short video then a POGIL activities that should be facilitated by teacher
2	<b>Unit8LM01 - Continue from day 1</b>			This needs to be completed in class and facilitated by teacher
3	<b>Unit8LM02</b> – The Language of Organic Chemistry (4 short videos total -15 min – some questions and a short worksheet – line drawings - follow the videos)		Read: 10.2	Can be done largely independently or at home
4	<b>Unit8LM03</b> – The diversity within organic chemistry - functional groups (18 min video) + functional group worksheet + couple of questions		Read: 10.3	In class or for HW
5	<b>Unit8LM04</b> – 4 min video + POGIL activity Organic Reactions	U8-Quiz1		Needs to be done in class facilitated by teacher

**Unit 8 Week 2: GOAL: Learn basics of polymers and introduce the concept of structure/ function and the engineering of plastics & recycling**

45 min	Lecture/Activity	Quest	7 <sup>th</sup> Ed	Teacher Notes
1	<b>Unit8LM05 – -Addition Polymers - 3 videos total 17 mins + questions</b>	Post U8-HW 2		Independent work, can be done at home or school
2	<b>Unit8LM06 – The Big Six Plastics - 2 videos – total 11 min + couple questions and worksheet – Big Six Plastics</b>		Read: 9.1-9.4	Refer to Table 9.1 in the book to answer the questions on worksheet
3	<b>Unit8LM07 – Condensation polymer reactions – 2 videos total 13 min video + some questions</b>		Read 9.5-9.6	Can be done as HW
4	<b>Unit8LM08 - POGIL – Polymer Chemistry</b> – this can be done now or before LM05.			Needs to be done in class, facilitated by teacher
5	<b>Unit9LM09-</b> Introduction to this activity (5 min video) <b>Guided Reading activity</b> covering sections in Chapter 9 on recycling and websites: LifeWithoutPlastics.com & TheDailyGreen.com search recycling	U8-Quiz 2	Read: 9.7-9.8, & Read Handout: Life Without Plastics	This can be done for HW, especially if LM08 spills over a day.

**Unit 8 Week 3: GOAL: Learn the basics about how different drugs work and the design process for new drugs.**

45 min	Lecture/Activity	Quest	7 <sup>th</sup> Ed	Teacher Notes
1	<b>Unit8LM10</b> Drug as molecules and the actions of those molecules (4 videos totally 27 min each followed by one or two questions)	Post U8-HW 3	Read 10.1,10.4,10.5	This can be done independently or at home for HW, leaving time in class to work on Quest HW in small groups
2	<b>Unit8LM11</b> – Steroids as bio-molecules and drugs ( 3 videos totaling 24 min video each followed by a couple of questions)		Read: 10.7	
3	<b>Unit8LM12 – Guided Reading</b> – Drug Approval Process and over the counter drugs complete worksheet while reading sections			Guided Reading – reading appropriate section in Chapter 10, depends on edition of book as to which sections – this can be done as HW
4	<b>Unit8LM13 -Worksheet</b> – Investigating Molecular Shapes (need internet access to do this one)		Read: 10.9,10.10 Do#: 35	Use the website 3Dchem.com to answer questions on worksheet, best if done in groups with teacher
5	<b>Flex Time</b>			

**Unit 8 Week 4: GOAL: Read some current articles about drugs and how they affect the body and society at large.**

<b>45 min</b>	<b>Lecture/Activity</b>	<b>Quest</b>	<b>7<sup>th</sup> Ed</b>	<b>Teacher Notes</b>
<b>1</b>	<b>Unit8LM14</b> Herbal Medicine (4 videos total 20 min plus questions)		Read 10.11	
<b>2</b>	<b>Unit8LM15 –</b> Bad Drugs: Natural Products and Designer Drugs (4 videos total 33 min followed by questions)	.	Read: 10.12	This can be done independently
<b>3</b>	<b>Unit8LM16 -</b> Bad Drugs – Designer Drugs - 5 min video ,plus read article and answer guided reading worksheet			Read US News and World Report article on Designer Drugs
<b>4</b>	<b>Unit8LM17 –</b> 4 min review video	U8-Quiz 3		
<b>5</b>	<b>Unit 8 Exam 8</b>			