ORGANIC CHEMISTRY

Dan. Libby 213 Collier Ext. 1436 E-mail: rdlibby@cs.moravian.edu	Class Hours MTWF 8:55-9:45 PPHAC 232	Office Hours Mon. 10:00 AM ->11:00AM Tues. 10:00 AM ->11:00AM Thurs. 11:00 AM ->12:00PM Fri. 12:00 PM -> 1:00PM Or any time, just call X1436

SCHEDULE OF CLASS TOPICS FOR CH 211 & 212

Introduction to POGIL and the structure of Scientific Arguments

What is POGIL? – First class

Data Interpretation – First week lab discussion

Introduction to the Structure of Organic Molecules

A. Molecular Representations and Isomerism [CGW CH 1 & 2: pp. 1-22]
B. Functional Groups, Double Bond Equivalents and Nomenclature [CGW CH 2: pp. 23-34, CH 3: pp. 74-76]

Equilibrium Controlled Reactions:

A. Organic Reactions: Thermodynamics *vs.* Kinetics [CGW CH 12: pp. 240-249]
B. Acid Base Reactions [CGW CH 8 pp. 163-181]
C. Reactions of Carbonyl Compounds. [CGW CH 5]
    1. What Happens?
    2. How and Why Does It Happen?
        a. Addition Reactions. [CGW CH 6 all, 22: pp. 498-510, CH 20 all & 26: pp. 614-639]
        b. Addition-Elimination Reactions. [CGW CH 11 all]
        c. Acyl Substitution Reactions. [CGW CH 10 all & CH 26: pp. 640-654]
    3. How are They Related?

Organic Structure: A Closer Look

A. Stereoisomerism [CGW CH 14 all]
B. Bond Rotations and Conformational Analysis [CGW CH 16 all]

Kinetically Controlled Reactions:

A. Review of Equilibrium Controlled Reactions [CGW CH 12: pp. 240-249, 266-267]
B. Kinetics vs. Thermodynamics [CGW CH 12: pp. 250-265]
C. Nucleophilic Substitution at Saturated Carbon [CGW CH 15 all]
D. Elimination Reactions [CGW CH 17 all]
E. Addition Reactions [CGW CH 19 all]
F. Electrophilic Aromatic Substitution [CGW CH 21 all]
G. Free Radicals and Their Reactions [CGW CH 37 all]
H. Biomolecules and Biological Reactions [CGW CH 42 all]

REQUIRED MATERIAL

-*Organic Chemistry*; by Jonathan Clayden, Nick Greeves and Stuart Warren; Oxford University Press, 2012 (ISBN: 978-0-19-927029-3) (**CGW**)

-*Making the Connections: A How-To Guide for Organic Chemistry Lab Techniques*; Second Edition, by Anne B Padías, Hayden McNeil 2011
(ISBN: 978-0-7380-4135-3 - paperback) (**Padías**)

-*Foundation Model Set for General and Organic Chemistry,* (**Models**)

COURSE GOALS

Again this semester the course is designed to help you to **discover** important aspects of the area of science identified as Organic Chemistry, to **develop fundamental concepts** that help us organize and understand organic reactions and to **be able to apply fundamental concepts to unfamiliar organic structures or reaction conditions**. We define **understanding of concepts** as the **ability to use them effectively in a variety of contexts**. The process of **discovery begins with chemical data** and requires that you **apply your previous experience to analyze the data** and **propose reasonable explanations** for trends in each new data set. The sequence of topics is designed such that **each new data set builds on the understanding that you developed in earlier analyses**.

COURSE ORGANIZATION AND CLASSROOM ACTIVITIES

Groups and Student Collaboration:

Again this semester, to aid you in your study of organic chemistry, each of you will be assigned to a **class discussion group**. Each group will consist of three, four or five students. For most of the laboratory experiments, you will also work in **research groups**. There may be some personnel overlap between class groups and lab groups, but usually, they will operate independently. Each member of your group will have a specific duty to assure that the workload is evenly distributed and to help each student develop a range of process skills. Educational research indicates that students who work in groups with their peers tend to learn more in their courses. I hope that you will find that working with the members of your group will give you better insight in your analyses of the daily assignments. Most of the **initial exploratory data analysis** will be done **within your groups outside of class** (See *Class Format* below). Then initial group responses will be discussed in the class as a whole so that we will generally reach a consensus as to the best interpretation of the data. The course structure encourages you to **take responsibility for and an active part in your learning** in organic chemistry. The compositions of groups will be changed periodically throughout the semester. Regardless of changes in group composition, specific role assignments will change each class period (See CLASS GROUP STRUCTURE on pp. 4-5.). **You will be expected to work together outside of class in preparing daily class assignments, analyzing lab data and devising answers to questions for exams** (See *Evaluation* pp. 3-4). I believe that you will find that small group discussions are very useful in generating ideas that stimulate learning.

Class Format:

As it did in the fall semester, this course employs a discussion format that is unconventional for science courses, but which is becoming more prevalent across the country. The value of class periods is largely dependent upon what each student contributes. Each day you will be given an activity sheet and an assignment for the following class period. Each activity will provide you with a particular set of data to analyze and some questions to guide your analysis. Then at the beginning of the following class, I will randomly select three or four groups to present their group responses to the assignment. Generally, these presentations will form the basis for whole class discussion. Consequently, **you will be asked to draw initial conclusions from data BEFORE any class discussion of the material has taken place**. This process requires that you rely on your own logic rather than something you have gotten from a lecture or textbook. From your work last semester you should have begun to develop a "sense" of organic chemistry and some confidence with presenting your ideas. After the initial group presentations, we will have a 5 to 10 minute group discussion period for all groups to develop responses to the initial presentations. After the group discussion period, a few additional groups will be selected to respond to the original groups' presentations, and other volunteer responses will be considered in an effort to reach consensus on the best interpretation of the data under consideration. When the first issue is settled, we will move on to the next consideration gradually building our understanding of organic chemistry. After each class each group submits **an electronic Recorder's Report,** which includes the group responses to activity questions (See Recorder on p. 5)

Communication Between Class Members and Professor

Often students immediately request names of potential tutors for this course. I have no problems with your seeking assistance from people who have had the course before, but my experience indicates that, in general, students who have problems in this course benefit much more from **seeking my help outside of class**. I realize that you might have significant concerns about going to the professor's office when you have problems. "If I tell him that I have problems, he'll think I'm stupid." This course is designed to initially determine what class members understand and don't understand, and then to work together to help everyone gain facility with the material. To this end, **any information I can get concerning problems students have is beneficial to the class as a whole**. The **best place to express your confusion is in class**. I recognize that you may be uncomfortable expressing a lack of understanding to the whole group. However, because the **course continually builds upon itself**, it is **critical that you solve your problems of understanding as soon as possible**. So, I recommend that you come and talk with me about problems that you feel uncomfortable about expressing in class.

ADMINISTRATIVE POLICIES

Laboratory Discussions and Periods:
Students are required to attend ***all*** laboratory discussions (usually Mon. 8:55-9:45 AM, see schedule in the Lab Manual) and all scheduled lab periods unless excused due to a valid medical excuse (verified by the Health Center or other health professional) or other accepted ***prior*** excuse. Make-ups or grade adjustments for excused absences will be arranged. **Grades for work missed due to unexcused absences will be zero**.

Exams or Quizzes:
Students are required to take all exams and quizzes. There will be ***NO MAKE-UPS***. If an exam or quiz is missed without a valid medical excuse (verified by the Health Center or other health professional) or other accepted ***prior*** excuse, the grade for that work will be zero. The grade for an exam or quiz missed due to an excused absence will be determined from the grades earned on the remaining exam(s) (including the final exam) or quizzes, i.e. more value will be added to subsequent exams or quizzes. Make-up finals for those with verified conflicts will be given on the last day of the final exam period.

NOTE: Trips scheduled for other courses or **travel schedules for weekends or breaks** are **NOT acceptable excuses** for missing classes, quizzes, exams, lab discussions or lab periods.

Evaluation

Grades:
All grades will be determined on an absolute letter grade scale, so there is **no disadvantage to any student for helping another.** In fact, often students develop a much better understanding of the concepts and material in the course by dealing with the different problems and viewpoints of other students. **Student collaboration is an important basis for the design of this course.**

Grade Distribution:
Your grade will be determined from grades on each activity during the semester as listed below.

Grade Distribution:

Library Project (Completion required to pass the course.)	3 %
On-line homework	9 %
Group Work	10 %
Quizzes (11) [Jan. 17, 24, 31, Feb. 7, 21, 28 Mar. 14, 21, April 4, 11 & 22]	10 %
Hour Exams (Feb. 14 & March 28) @14 %	28 %
Laboratory (Passing the lab is required to pass the course.)	20 %
Final Exam (Tuesday, April 29 at 8:30 AM)	20 %
TOTAL	100 %

Library Project
This project is designed to give you an opportunity to investigate the structure of the chemical literature. (See **Library Project** document.)

Group Work
Evaluation of your contribution to group work will be based upon:
- Your group's initial presentations in class and responses to questions in class (1/3 of daily grade)
- Your group's submission of your group Recorder's Report (1/3 of daily grade)
- Your individual voluntary contributions to class discussions (1/3 of daily grade).

Group Work Grades for each week will again be available in the Grade Center on the course Blackboard site. **It should be noted that an absent student cannot earn a contribution to a group grade on the day of an absence.**

On-line Homework:
After we complete most activities you will again have an electronic homework application assignment through the Sapling Learning System (https://www.saplinglearning.com/) Sapling's chemistry questions are delivered in a web browser to provide real-time grading, response-specific coaching, improvement of problem-solving skills, and detailed answer explanations. Dynamic answer modules enable one to interact with 3D models and figures, utilize drag-and-drop synthetic routes, and draw chemical structures - including stereochemistry and curved arrows. Altogether, Sapling is cheaper than a tutor, it provides more value than a solutions manual, and goes beyond a

mere assessment exercise to give a learning experience. See the First Class Assignment Sheet for instructions to enroll in Chem 212 on Sapling; the cost is $29.99 for the semester.

Quizzes

There will be 5 minute **individual in-class quizzes** each week. The quizzes are designed to provide some encouragement for everyone to get involved in the group activities and stay up-to-date with the development of new material throughout the semester. They also serve to give me feedback on what each student understands.

Mid-term Exams

The two **major exams** during the semester will be **in-class closed-book exams** on Friday, February 14 and Monday, March 28. The exams will consist of some specific "simpler" questions, and 2 to 4 "more complex" questions, which will require you to apply concepts developed in class to new situations. As was done last semester, **one week prior to each exam** (Friday, February 7 and Monday, March 21) a packet with some "simpler" questions, and 4 or 5 specific "more complex" questions will be distributed. The "simpler" questions will be representative of the type of "simpler" questions that are likely to be on the exam. However, the **"more complex" questions** on the exam will be taken **verbatim from the packet** distributed. You will then have one week to work alone, **with your group members, or anyone else in the class to devise answers to the questions**. During your deliberations, you may ask me questions, but you are **not allowed to consult any student assistant in the course or anyone not involved in the course this semester**. The exams will be written in class on Friday, February 14 and Monday, March 28. A periodic table of the elements will be provided and **you may bring molecular models, a calculator and writing implements to the exam, but NO notes, books, handouts or electronic material may be used and there will be NO consultation or collaboration among students during the exam.** Thus, you can work together in devising answers, but the final copy of your exam should express your own understanding of the material.

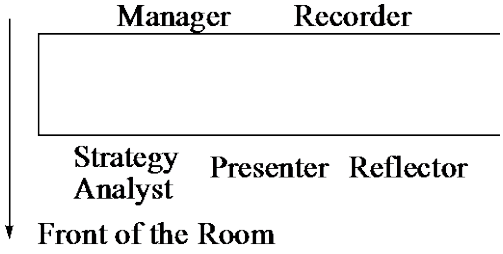
Final Exam:

The final exam will be given during the 3 hour final exam period assigned by the registrar, Tuesday, April 29 at 8:30 AM. The packet of questions for the final exam will be distributed one week before the assigned examination period, Tuesday, April 22. Rules for preparing for and writing the final exam are the same as those for the mid-term exams.

CLASS GROUP STRUCTURE

Group Composition and Dynamics:

As indicated in the Administrative Policies, much of your class work in CHEM 212 will be done in groups of three, four or five students. Each member of the group has a specific role to play in making your collective learning experiences profitable. The definitions of the specific roles to be assigned are listed below. Group membership will change at times during the semester, however, one aspect of group work will remain constant; **each day all members of the group will be assigned a new role and have a specific position at the table**. (See the diagram and note that **the manager is facing the front of the room**.)



***Group Role Definitions*:**

Manager

Manages the group. Insures that the group has the **appropriate materials** (class and lab textbooks, molecular models, etc.), **members are fulfilling their roles**, the **assigned tasks are being accomplished on time**, and **all members** of the group **work through activities step-by-step**

together and **understand the concepts**. The Manager **communicates with the instructor** when information or assistance is required and is responsible for seeing that group reports **are submitted in a timely manner**.

Recorder

Obtains the **group tablet laptop** and **records group answers and explanations** of the group's conclusions for each question in the electronic class activity for the day. Is **responsible for determining that all group members understand** and **agree on the group's response** to an activity question **before moving on** to the next question. At the end of each class period, **copies the group Electronic Recorder's Report to the network server** and returns **the group tablet laptop** to the cart **assuring that it is plugged in for charging**. The Electronic Recorder's Report will be considered to be the official group response to each day's activities.

Strategy Analyst

At the direction of the manager, **reads each activity question to the group** to help the group stay together. As the activity develops, **focuses on how the sequence of questions leads** the group **to develop particular concepts**. At the end of each activity, leads the Strategy Analyst's Report Discussion of the logic behind the sequence of questions of the activity and assures that the sense of the group is documented by the recorder.

Presenter

When necessary, obtains the group folder at the beginning of class. **Explains group conclusions** to the class when requested by the instructor; these explanations will usually be presented in conjunction with the recorder's report projected on the screen in front of the class, and will be the bases for whole class discussions. **Shares information with other groups** when indicated by the manager or instructor. **Returns the group folder** to the instructor at the end of class.

Reflector

Observes and comments to the manager **on group dynamics and behavior** with respect to the learning process, and **the effectiveness of the group** in dealing with daily assignments. May be called upon to report to the group, the instructor, or the entire class concerning how well the group is operating or what needs improvement and why. Assures that all **group members recognize the concepts developed** in each activity. At the end of each activity, leads the Reflector's Report Discussion identifying the group's consensus on the key concepts developed by the group and identifying the group's remaining questions.

NOTE: In groups of **four people**, one student will fill both the **Presenter and Reflector** roles and in groups of **three people**, another student will fill both the **Manager and Strategy Analyst** roles.

COLLABORATION AND ACADEMIC HONESTY

Collaboration among students in class and in preparation for class discussion is generally encouraged and required for most classes. Educational research indicates that students learn best when they engage in discussions and analyses of class material with their peers. However, the final version of all written work submitted for evaluation must be prepared without consultation with other students. To be fair to all students in the course and to assure maximum learning for each student, we follow all the guidelines for academic honesty spelled out in the *Moravian College Student Handbook* (See College Website http://www.moravian.edu/studentLife/handbook/academic/academic2.html).

DISABILITY SUPPORT

Students who wish to request accommodations in this class for a disability should contact Ms. Elaine Mara, Assistant Director of Learning Services for Disability Support, 1307 Main Street (extension 1510 - marae@moravian.edu). Accommodations cannot be provided until authorization is received from the office of Learning Services.

MORAVIAN COLLEGE CHEMISTRY DEPARTMENT

Chemistry 212L

Organic Laboratory

LABORATORY MANUAL

Spring Semester 2014

Dr. Dan Libby	213 Collier X-1436	rdlibby@chem.moravian.edu libbyr@moravian.edu
Dr. Carol B. Libby	228 Collier X-1629	cblibby@chem.moravian.edu libbyc@moravian.edu

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PART V: Theory

Weekly Schedule

Week 1

Laboratory Discussion
(Monday, January 13)

Topic: Regular Class Period

Laboratory Periods
(T-F, January 14-17)

Assignment: Lab Manual: Read:
Experiment 1: How Can We Tell the Difference Between Stereoisomers and Why is it Important for NSAID Drugs?
A. What are chiral compounds and how can we recognize them?
(pp. Ex1-1 & Ex1-2) and Stereoisomers: p. A1)

Topic: Configurational Isomers – Lab Manual Part V A pp. A2-A6

Week 2

Laboratory Discussion
(Friday, January 17)

Assignment: Website: Complete Pre-lab Preparation Assignment for
Experiment 1: How Can We Tell the Difference Between Stereoisomers and Why is it Important for NSAID Drugs?)
B. How can we isolate the drugs?

Topic: Isolation of acidic compounds & Chirality and Optical Activity – Lab Manual Part V A pp. A7-A9

Laboratory Periods
(T-F, January 21-24)

Activity: Experiment 1: How Can We Tell the Difference Between Stereoisomers and Why is it Important for NSAID Drugs? (See Website)
B. How can we isolate the drugs?

Week 3

Laboratory Discussion
(Monday, January 27)

Assignment: Website: Complete Pre-lab Preparation Assignment for
Experiment 1: How Can We Tell the Difference Between Stereoisomers and Why is it Important for NSAID Drugs?
C. *How can we characterize their stereoisomers?*

Topic: Chirality and Optical Activity (continued) and Nomenclature of Chiral Compounds

Laboratory Periods
(T-F, January 28-31)

Activity: Experiment 1: How Can We Tell the Difference Between Stereoisomers and Why is it Important for NSAID Drugs? (See Website)
C. *How can we characterize their stereoisomers?*

Week 4

Laboratory Discussion
(Monday, February 3)

Assignment: Lab Manual: Complete Pre-lab Preparation Assignment for Experiment 2 How Can We Determine if Acid and Base Catalysis Work Equally Well in Acyl Substitution Reactions?

A. What experiments will allow us to determine the cause of different reaction outcomes for vanillin acetylation in acidic vs. basic reaction mixtures if they occur? (Ex-2-1 & Ex-2-2)

Topic: Discussion of answers to the Question of the Week and How do we Determine Structures of Organic Compounds from Spectra?

Laboratory Periods
(T-F, February 4-7)

Activity: Experiment 2 How Can We Determine if Acid and Base Catalysis Work Equally Well in Acyl Substitution Reactions?

A. What experiments will allow us to determine if outcomes for vanillin acetylation in acidic vs. basic reaction mixtures are different and what might cause the difference?

Week 5

Laboratory Discussion
(Monday, February 10)

Assignment: Website: Complete Pre-lab Preparation Assignment for Experiment 2: How Can We Determine if Acid and Base Catalysis Work Equally Well in Acyl Substitution Reactions?

B. How can we determine the structures of the products?

Topics: Retrosynthetic Approach for Synthesis of Organic Compounds: Alcohol Synthesis

Laboratory Periods
(T-F, February 11-15)

Activity: Experiment 2 How Can We Determine if Acid and Base Catalysis Work Equally Well in Acyl Substitution Reactions?

B. How can we determine the structures of the products?

Alcohol Synthesis: Out of Class Exercises Manual p. C5

Week 6
Laboratory Discussion
(Monday, February 17)

Assignment:	Website:	Complete Pre-lab Preparation Assignment for Experiment 2: How Can We Determine if Acid and Base Catalysis Work Equally Well in Acyl Substitution Reactions? *C. What do our results reveal about structures and reaction conditions that cause unexpected acetylation products to form and what new mechanisms are operating?*
Topics:	Retrosynthetic Approach for Synthesis of Organic Compounds: Alkene Synthesis	

Laboratory Periods
(T-F, February 18 -21)

Activity:	Experiment 2	How Can We Determine if Acid and Base Catalysis Work Equally Well in Acyl Substitution Reactions? *C. What do our results reveal about structures and reaction conditions that cause unexpected acetylation products to form and what new mechanisms are operating?*
	Alkene Synthesis: Out of Class Application, Manual p. C7	
Due:	**Report on Experiment 1**	

Week 7
Laboratory Discussion
(Monday, February 24)

Assignment:	Lab Manual:	Complete Pre-lab Preparation Assignment for Experiment 3: How can a Complex Alkene be Synthesized? *A multi-step synthesis of 2-methylheptenes.* *A. How can we choose starting materials for the synthesis and get the synthesis started?* (pp. Ex-3-1 & Ex-3-2)
Topics:	Discussion of Out of Class Applications from Lab Manual p. C 7 and Choice of Starting Materials for Synthesis of 2-Methylheptenes	

Laboratory Periods
(T-F, February 25 - 28)

Activity:	Experiment 3:	How can a Complex Alkene be Synthesized? A multi-step synthesis of 2-methylheptenes. (See Website) *A. How can we choose starting materials for the synthesis and get the synthesis started?*

Week 8

Laboratory Discussion
(Monday, March 10)

Assignment: Website: Complete Pre-lab Preparation Assignment for
Experiment 3: How can a Complex Alkene be Synthesized?
A multi-step synthesis of 2-methylheptenes.
A. How can we choose starting materials for the synthesis and get the synthesis started? Week 2

Topics: Alcohol Oxidation
and
Multiple Disconnections in Organic Syntheses

Laboratory Periods
(T-F March 11-14)

Activity: Experiment 3: How can a Complex Alkene be Synthesized?
A multi-step synthesis of 2-methylheptenes.
A. How can we choose starting materials for the synthesis and get the synthesis started? Week 2

Due: Report on Experiment 2

Week 9

Laboratory Discussion
(Monday, March 17)

Assignment: Website: Complete Pre-lab Preparation Assignment for
Experiment 3: How can a Complex Alkene be Synthesized?
A multi-step synthesis of 2-methylheptenes.
B. What is the outcome of the dehydration of an alcohol?

Topic: *What alternate alkene products might be expected from the dehydration of 2-methyl-3-heptanol?*

Laboratory Periods
(T-F March 18-21)

Activity: Experiment 3: How can a Complex Alkene be Synthesized?
A multi-step synthesis of 2-methylheptenes.
B. What is the outcome of the dehydration of an alcohol?

Week 10

Laboratory Discussion
(Monday, March 24)

Assignment: Lab Manual: Complete Pre-lab Preparation Assignment for Experiment 4: What Can Identities of Products Tell Us About Mechanisms of Elimination Reactions of Alcohols and Alkyl halides? A. *What reactions should be studied and how might we analyze the products?* (See pp. EX-4-1 and the Expt 4 Part A page of the Website)

Topic: Choices of reactions and analytical methods for Experiment 4 Part A

Laboratory Periods
(T-F March 25-28)

Activity: Experiment 3: How can a Complex Alkene be Synthesized?
A multi-step synthesis of 2-methylheptenes. (See Website)
B.What is the outcome of the dehydration of an alcohol?

Week 11

Laboratory Discussion
(Monday, March 31)

Assignment: Easter Break

Laboratory Periods
(T-F April 1-4)

Activity: Experiment 4: What Can Identities of Products Tells Us About Mechanisms of Elimination Reactions of Alcohols and Alkyl halides?
A. *What reactions should be studied and how might we analyze the products?*

Week 12

Laboratory Discussion
(Monday, April 7)

Assignment: Regular Class

Laboratory Periods
(T-F April 8-11)

Activity: Experiment 4: What Can Identities of Products Tells Us About Mechanisms of Elimination Reactions of Alcohols and Alkyl halides?
B. How do product identities help us determine the reaction mechanism? (See Website)

Due: Report on Experiment 3

Week 13

Laboratory Discussion

(Monday, April 14)

Assignment: Regular Class

Laboratory Periods

Activity: **T-Th April 15-17 –No Labs Due to 4/18 Easter Break**

Week 14

Laboratory Discussion

(Monday, April 21)

Assignment: No Class Easter Break

Laboratory Periods

(T-F April 22-25)

Activity: Check Out

Due: Report on Experiment 4

CHEM 212 Spring Term Calendar

January 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12	13 Lab Wk 1	14	15	16	17 **Quiz 1** Lab Disc. Wk 2	18
19	20 MLK	21 Lab Wk 2	22	23	24 **Quiz 2** -Lib. Proj. Sign-up	25
26	27 Lab Wk 3	28	29	30	31 **Quiz 3**	

February 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3 Lab Wk 4	4	5 **Intro to Chemical Literature Searching**	6	7 **Quiz 4** **-Question for Exam I**	8
9	10 Lab Wk 5	11	12	13	14 **Exam I**	15
16	17 Lab Wk 6	18 **-Expt. 1 Lab Rpt.**	19 **-Expt. 1 Lab Rpt.**	20 **-Expt. 1 Lab Rpt.**	21 **Quiz 5** **-Expt. 1 Lab Rpt.**	22
23	24 Lab Wk 7	25	26	27	28 **Quiz 6** **Mid-Term**	

March 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 Spring Recess
2 Spring Recess	3 Spring Recess	4 Spring Recess	5 Spring Recess	6 Spring Recess	7 Spring Recess	8 Spring Recess
9 Spring Recess	10 Lab Wk 8	11 **-Expt. 2 Lab Rpt.**	12 **-Expt. 2 Lab Rpt.**	13 **-Expt. 2 Lab Rpt.**	14 **Quiz 7** **-Expt. 2 Lab Rpt.**	15
16	17 Lab Wk 9 **- Lib. Proj. Citations due**	18	19	20	21 **Quiz 8** -Questions for Exam II	22
23	24 Lab Wk 10	25	26	27	28 **Exam II**	29
30	31 Lab Wk 11					

April 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4 **Quiz 9** **Last withdrawal with W**	5
6	7 Lab Wk 12	8 **-Expt. 3 Lab Rpt.**	9 **-Expt. 3 Lab Rpt.**	10 **-Expt. 3 Lab Rpt.**	11 **Quiz 10** **-Expt. 3 Lab Rpt.**	12
13	14 Lab Wk 13 **Lib. Proj. Due**	15 No PM Lab	16 No PM Lab	17 No PM Lab	18 **Easter Break**	19 **Easter Break**
20 **Easter Break**	21 **Easter Break** Lab Wk 14	22 **Quiz 11** **-Expt. 4 Lab Rpt.** -Questions for Final Exam	23 **-Expt. 4 Lab Rpt.**	24 **-Expt. 4 Lab Rpt.**	25 **-Expt. 4 Lab Rpt.**	26 **Classes End** Final Exams
27 Final Exams	28 Final Exams	29 Final Exams **Chem 212 Final Exam 8:30 AM**	30 Final Exams			

May 2013

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1 Final Exams	2 Final Exams	3