

# CHEMISTRY 142Q

SPRING 2017

<b>CLASS SCHEDULE:</b>	<b>Section 9A</b> MWF – 9:30-10:35 AM <b>Section 10A</b> MWF – 10:45-11:50 AM
<b>INSTRUCTOR:</b>	Dr. Nichole Powell
<b>THE OFFICE:</b>	OSB 420
<b>OFFICE HOURS:</b>	Designated hours: <b>Wed</b> 12:40 – 4:40 pm <b>Fri</b> 2:30 – 3:30 pm You may stop by my office at any other time. The last 15 minutes of most class sessions will also be reserved for answering questions.
<b>CONTACT INFORMATION:</b>	<b>Email:</b> nichole.powell@emory.edu <b>Telephone:</b> 770-784-8396

## 1. Course Description/Objectives.

General Chemistry II (CHEM 142) is the second of a two-semester course sequence designed to introduce you to the fundamental terminology, principles, and theories of chemistry. The topics taught will provide you with the skills and competencies needed in higher-level chemistry courses.

The “**Ways of Inquiry**” at Oxford College

“Ways of Inquiry” (INQ) courses are designed to introduce students to the specific ways knowledge is pursued in each discipline through active engagement in the discipline’s method of analysis. INQ courses start with questions, are student-centered and often collaborative, and they place increasing responsibility on students for their own learning. Students not only experience each discipline’s distinctiveness but also move beyond its boundaries to understand connections with other disciplines and fields.

The “**Ways of Inquiry**” in CHEM 142Q

Inquiry is the quest for knowledge, the process of asking questions and seeking answers. Although we use a textbook in class it is important for you, as a chemistry student, to understand how we got to this point, how the knowledge was gained. Understand as well that knowledge is not stagnant and that we are always gaining new knowledge to help us understand the world around us. How is it that we know what we know? How is this done in the discipline of chemistry? What is the process? The acquisition of knowledge is based on the quest to answer questions but how can you know that you are asking good questions and how do you know the steps you need to take in order to answer your questions? How can you understand/make sense of the answers? What does it mean?

Inquiry in chemistry helps you to appreciate how a chemist approaches the world and gives you an understanding of the systematic process used in seeking answers to questions and determining the validity of those answers. In this course, particularly in the lab, you will design experiments in order to collect data/evidence that will be used to answer the questions that will be posed. You will evaluate the accuracy, reliability, and validity of the data/evidence collected. You will use the data/evidence to support your conclusions.

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**2. Learning Objectives.** The primary learning objectives for this class are for you to:

- Gain factual knowledge (terminology, classifications, methods, trends)
- Learn fundamental principles, generalizations, or theories
- Learn to apply course material (to improve thinking, problem solving, and decisions)
- Develop specific skills, competencies, and points of view needed by professionals in the field most closely related to this course

In achieving these objectives you should be able to:

- Utilize critical thought and reasoning to understand chemical behavior at the microscopic and macroscopic levels.
- From your knowledge of chemistry and chemical systems, be able to develop solutions to problems which you have not encountered before.
- Understand the role of chemistry in everyday life.

**3. Content goals.** You will be expected to master these areas of chemistry:

- Coordination compounds and crystal field theory
- Intermolecular forces
- Phase diagrams
- Concentration units
- Factors affecting solubility
- Colligative properties
- Kinetics, including rates of reaction and reaction mechanisms
- Equilibrium, including Le Chatelier's Principle
- Acids, bases, buffers
- pH and titrations
- Solubility equilibrium
- Entropy and free energy
- Electrochemistry, including electrochemical cells and electrolysis
- Nuclear chemistry

### CLASS MATERIALS (REQUIRED):

1. "Chemistry"- CONNECTPLUS -12<sup>th</sup> Ed. by Chang (ISBN 9781259286162)
2. Scientific calculator (must be brought to every class). Calculators that can download and/or store information, can automatically solve equations or perform conversions, or can be programmed, are not allowed on quizzes/exams. The two calculators which are allowed are TI-30Xa or 30X II. These are generally available from places like Amazon or WalMart for under \$15. Any other calculators will have to be checked and approved by the instructor. Students will not be allowed to borrow calculators from their classmates during class assignments, quizzes, or exams. The use of cell phones and PDAs will not be allowed.

For Lab – must have before your first lab meeting

3. Carbon-copy lab notebook.
4. Safety glasses.

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### COURSE COMPONENTS:

#### **LECTURE:**

Lectures will emphasize the concepts and skills necessary for you to understand and investigate chemical behavior. It is also important that you become conversant with the language chemists use. Research on learning shows that explaining concepts helps you to better understand and retain the material that just merely listening to an explanation. It is therefore important that you prepare for each class, actively participate in lecture and ask questions when you do not understand the concepts. To help you understand the course material each class session will involve you working in groups to solve problems and explain your problem-solving strategy.

A goal of this course is for you to understand and relate the course material to chemical principles encountered in everyday life. To meet this goal, on each exam you will be expected to give a real world example (not covered in class or discussed in your text) and explanation of a concept from each of the chapters covered on that exam.

#### Attendance

You are expected to attend each class period. You are allowed 3 absences in lecture and NO absences in lab. Each absence exceeding 3 absences will result in a corresponding point deduction from your final course grade (eg. 4 absences= 1 pt, 5 absences= 2 pts etc). There are no excused absences. Being cited 2 times for any combination of the following behaviors will count as 1 absence: arriving more than 10 minutes late for class, walking in and out of class (unless you are sick), leaving class early, being inattentive or working on other assignments during class.

You are responsible for all material covered in the lecture even if you were absent.

#### Graded Assignments

Graded assignments (includes graded homework and learning modules) will be given throughout the semester. The assignments will usually be housed on Canvas. Graded assignments will include chapter quizzes/homework which will usually be due within 48 hrs after we have completed the chapter in class.

#### Non-graded Assignments

You are expected to complete all assignments regardless of whether or not they will be graded. You are expected to work all in-chapter and end of chapter problems in your textbook unless otherwise noted.

#### Pop Quizzes

Pop quizzes will be given during the first 5 minutes of class throughout the semester. These quizzes are unannounced and will be used to assess your understanding of the course content. Pop quizzes will primarily assess the content covered in the previous class session. Your lowest pop quiz grade will be dropped. Bonus pop quiz points may be earned during lecture for completing assigned problems during a given time period. These bonus points count only towards the pop quiz grade and may not exceed the maximum number of pop quiz points available during the semester. There is a limit on the number of bonus points you may earn per class.

#### Examinations

Four (4) exams are scheduled during the regular class period. No make-up examinations will be given. Excuses including the reason for missing an exam must be presented **before** the scheduled exam- this may be done by email or sending a note to class. If the excuse is accepted, the grade

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obtained on the final exam will count in place of the missed exam. If your excuse is not accepted, you will receive a zero for that exam. You may only be excused from missing 1 exam.

### Anticipated Exam Schedule:

Exam	Material Covered	Projected Date
1	Ch. 23 – Ch. 12	Friday, Feb. 3
2	Ch. 13. – Ch. 14	Friday, Feb. 24
3	Ch. 15 – Ch. 16	Wednesday, Mar. 29
4	Ch. 17 – Ch. 19	Friday, Apr. 21

Exam dates are subject to change. The sections to be covered in each exam will be announced in class.

**Final Exam** – will be given during the final exam period.

**Section 9A** on Monday, May 1 at 9 am – 12 noon.

**Section 10A** on Tuesday, May 2 at 9 am – 12 noon.

The final examination is mandatory and will be comprehensive. Any material discussed during the semester may be included in this exam. Final exams will not be returned.

### **LABORATORY:**

Laboratory sessions are designed to reinforce the concepts learned in lecture while exposing you to the skills necessary to investigate scientific questions. Laboratory sessions will be three hours per week. Each session will begin with a pre-lab meeting during which you will do, where applicable, the pre-lab quiz for that week's experiment and a post-lab quiz on the previous week's experiment. You will submit a lab assignment for each experiment – the due date is given in your lab syllabus. Please consult your laboratory syllabus all information regarding labs.

### **COURSE GRADE:**

Your course grade will be computed as follows:

Graded Homework	4%
Learning Modules	2%
Pop Quizzes	3%
Exams (4)	56%
Final Exam (Cumulative)*	15%
<u>Laboratory<sup>#</sup></u>	<u>20%</u>
Total	100%

\* Your final exam grade may be used to replace your lowest exam grade with the following exceptions: 1) If you have a zero on an exam due to missing the exam without a valid excuse no grade may be replaced, including the zero. 2) If you missed an exam with an accepted excuse only the grade for the excused exam may be replaced.

<sup>#</sup>Consult your laboratory syllabus for grading details.

### GRADING SCALE

A = 93 – 100    A- = 90 – 92    B+ = 87 – 89    B = 83 – 86    B- = 80 – 82    C+ = 77 – 79  
C = 73 – 76    C- = 70 – 72    D+ = 67 – 69    D = 60 – 66    F = below 60 F

Note: You must have a passing grade in both lecture and lab to pass the course. If you fail either the lecture or the lab you will receive an "F" in the course

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Final course grades will only be available in OPUS. Final exam grades will not be distributed.

### *Errors in grading:*

Exams should be reviewed immediately upon return for grading or addition errors. If there appears to be an error, submit your request for a regrade **in writing** no later than three days after the exam was returned in class. The Regrade Request form is available in Canvas.

### HONOR CODE

It is expected that students will adhere to the Honor Code. It is expected that students will not cheat, contribute to or condone the cheating of others. You are therefore expected to submit your own best effort on all assignments. Exams will not be proctored unless it is believed that the Honor Code is being violated. Pens/pencils and a non-programmable calculator are the only tools you are allowed to bring to and use in exams (no cell phones). Unless otherwise specified, collaboration is not allowed in any assignment to be submitted – including laboratory reports. You may collect data in groups however you may not collaborate with other students when completing lab report sheets/data analysis reports/lab reports.

### CRITICISM/FEEDBACK

Criticism/feedback is given in a variety of ways – dependent on the type of assignment. Below is the key for criticism/feedback given on quizzes/exams.

- CAL – calculation error
- CON – inadequate understanding of concept
- CVF – problems with conversion factor
- FORM – incorrect formula or wrong use of formula
- SFU – problems with significant figures and/or units

For essays/formal reports, criticism/feedback is given in the form of a grading rubric, which provides details on the grading of each area assessed.

### “RULES OF ENGAGEMENT”

Class should be an environment that is conducive to learning and free from distractions that could interfere with the learning process. Expectations regarding class deportment and interpersonal interaction will be discussed on the first day of class. Below are a few general notes.

- You are expected to arrive to class on time and stay for the entire class period (no walking in and out of class unless you are sick).
- You are expected to be attentive and participate during class.
- You are expected to bring your textbook and calculator to class.
- Laptops and tablets are only to be used for class purposes.
- Cell phones are not allowed in class. You will be asked to leave the class if you are caught texting or using your phone.

### Q&A SESSIONS

A question and answer session will be conducted in the class session prior to each exam.

### CANVAS

Canvas will be the primary means of communicating outside of class. It will also house supplementary course resources. Students are also expected to read the Canvas site

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regularly.

### AVAILABLE RESOURCES

- **Need help** – please come to office hours at the first sign of trouble. You should also attend the weekly SI sessions even if you think you have mastered the material.
- **Need more problems** - the textbook "Chemistry: A Molecular Approach" by Tro (including solutions manual) is available as a course reserve in the library (1 hr limit).

### ACCOMMODATION

Students who have a documented disability and believe that they may need accommodation in this course are encouraged to contact the Access and Disability Services Resources (ADSR) ([adsroxford@emory.edu](mailto:adsroxford@emory.edu); 770.784.4690) as soon as possible to ensure that such accommodations are implemented in a timely fashion.

### ADDITIONAL INFORMATION

Quiz and Exam keys will be posted on Canvas. Exam keys are posted 24 hrs after the exam is returned in class. It is very important that you spend time reworking questions you had difficulty with before looking at the exam key. If you are still having difficulty after consulting the key – please see me for help.

### COURSE SCHEDULE

Chap. 23, sections 1, 3 - 5, 7	Chap. 15
Chap. 11	Chap. 16
Chap. 12	Chap. 17
Chap. 13	Chap. 18
Chap. 14	Chap. 19

\* The learning objectives for each chapter are available in Canvas.

The course schedule is subject to change. The sections to be covered in each exam will be announced in class.

### **Welcome to CHEM 142Q!**

In order for you to become fluent and proficient in a foreign language (eg. Spanish or French) you have to spend time practicing (reading, writing, and speaking) the language. Chemistry is like a foreign language and in order to become proficient you must spend time reading (textbook), writing (solving many problems, and a variety of problems), and speaking (explaining concepts and using the correct terminology) Chemistry. All activities and assignments given in this course are to help you become proficient in Chemistry. I encourage you to have an open mind, actively participate in class and lab, and consistently spend time practicing Chemistry!

Student perspective of this course:

- The course challenged me to stretch my understanding of chemistry and to link concepts together.
- This course has helped me immensely in my thinking and although the course didn't come extremely easily, it was worth putting in the extra effort.

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- The lab... provided a real world application for the concepts we learned in class.

Advice from former students on how to succeed in this course:

- Put the time and effort into getting to know the information. No, I don't mean memorization. Actually try understanding what you read or what you hear in lecture; it will go a long way.
- Stay on top of everything, because it's near impossible to catch up when you're behind.
- Practice problems! Reading the book isn't studying; it's not enough.
- Plan ahead! Do not think that you can just study for the tests the night before and ace them with flying colors. This course requires a lot of practice.
- Always pay attention to lab materials.

**Student work submitted as part of this course may be reviewed by Oxford College and Emory College faculty and staff for the purposes of improving instruction and enhancing Emory education.**

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### TENTATIVE LECTURE SCHEDULE

The topics covered and lecture schedule is subject to change, depending on the pace of the course.

Date	Chapter
1/11	23
1/16	MLK DAY
1/20	11
1/25	12
2/3	Exam 1
2/6	13
2/13	14
2/22	15
2/24	Exam 2
3/3	LAST DAY TO WITHDRAW
3/6	SPRING BREAK
3/13	16
3/29	Exam 3
3/31	17
4/7	18
4/21	Exam 4
4/24	Last Day
5/1 or 5/2	Final Exam - Cumulative