

Chemistry 100 – Introductory Chemistry W/Lab

This introductory course is designed to meet the needs of three distinct groups of audience: 1) pre-nursing students, 2) beginning science majors, and 3) non-science majors seeking graduation distributive requirements. In dealing with a diverse group of students it is a challenging task to keep their interest level high through various materials. In the previous years, the course was taught with a typical divide-and-conquer approach on a dozen or more major topics. Individual topics were covered with appropriate breadth and depth designed for the introductory level. However, the course required a unifying theme that would allow the entire class to comprehend and appreciate the bigger picture made up of important individual pieces. After learning from and experiencing the Piedmont Project, it became clear what my course's unifying theme was going to be: Sustainability through Science. The course will have three umbrella categories dealing with sustainability in food: 1) What is food?, 2) Where does food come from?, and 3) Lessons from a living aquatic system. The most exciting aspect of these categories is that the topics lend themselves for in-depth discussions related to real world issues dealing with the food crisis. Furthermore, these categories allow for collaborations with my colleagues in biology, sociology, anthropology, business, environmental science, and other fields as the class examines the link between the scientific analysis of food and the food's role in the society.

Contained within these broad topics will be all the fundamental chemistry topics found at the introductory general/organic/biological chemistry topics. The range of the topics can be found in the syllabus for your review. Expectations from this newly revised course are to: 1) find the right balance between the core chemistry contents and the overarching theme, 2) perfecting the laboratory experiments to tie in the contents, and 3) raise students' awareness and interest in the sustainability practices in food production after the completion of the course.

Instructor: Sean J. Mo, Ph.D. **Office:** Pierce 1xx **Phone:** 770-484-4514 **E-mail:** sean.mo@emory.edu

Class Schedule: Tues/Thurs – 11:50a – 1:30p **Classroom:** Pierce 223

Office hours: Mon: 4:00-5:00p, Tue: 4:00-5:00p, Wed: 10:00-11:00a, Th: 10:00-11:00a and by appointment

Text and Materials:

- *Introduction to General, Organic and Biochemistry*, 10th ed. by Bettelheim. (Required)
- A *non-programmable* scientific calculator that can handle power-of-ten scientific notation for numbers (Required)
- Carbon-copy laboratory research notebook (Required)
- Approved safety glasses (Required)
- An open mind, willingness to learn, and dedication. (Definitely required)

Course Description: In this course, you will explore introductory topics in chemistry. The overall theme for this course is Sustainability through Science. More specifically, topics related to the sustainability practices related to food production will be examined throughout the course. This interdisciplinary approach will assist with the application of individual chemistry topics used in the real world. The topics to be covered in the course range from the concept of mole, ionic and molecular compounds, ionic compounds, stoichiometry, acid-base reaction, pH, reaction rates, atomic spectroscopy, and the periodic table to other fundamental chemistry topics. At the conclusion of this course, you will have gained expertise in both quantitative and qualitative chemical problem solving and reasoning which will assist with how you view and process real world issues related to food production. Furthermore, the laboratory component of the course will give you the necessary hands-on skills to experience the practical chemistry application related to aforementioned topics.

* Rest assured, this course is not meant to be Cooking 101. After the completion of the course, the fundamental chemistry knowledge can be transferred to other natural science and nursing majors. ☺

Attendance: Attendance is expected in all lectures and laboratory experiments. If a lecture is missed due to an excused absence, then it will not be counted against your grade. If a lecture is missed without an excuse, you will be given a warning. If a second lecture is missed, each missed lecture will result in 2% deduction in the overall course grade.

Please do not text message or browse the web during class (unless given a permission). If you are caught texting or surfing the web, your course grade will be severely affected.** (See below for an explanation.)

In Class: In this course, when needed, additional materials will be posted on the Blackboard website or handed out in class. The purpose of posting the handouts is to allow you to listen to the lecture and participate in class discussion. This is not meant to allow you to skip class and to assume that you can learn everything from the posted materials. As you will see, everything that we do in class is not posted on the web.

Assignments: Problems will be assigned in class or posted on the Blackboard website. Selected assignments will be graded throughout the semester. Late work will NOT be accepted.

Laboratory: Laboratory attendance is **mandatory**. A missed lab results in automatic failure of the class. If you have any planned absences during the semester, notify the instructor at the beginning of the semester.

Participation: Prompt attendance is expected at every class meeting. Each morning, there will be clicker questions for you to answer. Your participation grade will be based on your attendance, clicker questions, and group discussions.

** Please do not use your mobile/smart phone, or tablet in class. Texting or using apps on your phone will be disruptive not only to your learning, but also to those that are around you. If you are caught using the phone, the first time, you will be given a warning. If you are caught using the phone for a second time, your participation grade will be dropped to 50%. On your third warning, your participation grade will be dropped to 0%.

Quizzes: There will be three quizzes throughout the semester to reinforce the contents you learn from the class. These will take place of the clicker questions at the beginning of the class on assigned days. No make-up quizzes will be given. If you walk in after a quiz has been administered, you will receive a zero on your quiz.

Exams: There will be three (3) hourly exams in class throughout the semester. 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 e-mail or sending a note to class. If the excuse is accepted, the grade 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 one (1) exam.

Anticipated Exam Schedule:*
#1 October 2nd, 2014 - Thursday
#2 October 30th, 2014 - Thursday
#3 November 20th, 2014 - Thursday

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

Final Exam: The final exam will be on December 17th, 2014 (Wednesday) from 09:00-12:00 EST. (Section 11J) The final examination is mandatory and will be *comprehensive*. The contents of the final examination will be announced in class. The final examination will not be returned; however, you are welcomed to view your grade.

Grading	Items	Points	Date	Materials Covered
	•Exam 1	100	Oct. 2 nd , 2014 (Thur.) 12:00-1:20p	consult Exam Topics 1
	•Exam 2	100	Oct. 30 th , 2014 (Thur.) 12:00-1:20p	consult Exam Topics 2
	•Exam 3	100	Nov. 20 th , 2014 (Thur.) 12:00-1:20p	consult Exam Topics 3
	•Final Exam*	200	Dec. 17 th , 2014 (Wed.): 09:00-12:00	consult Final Exam Topics
	•Homework	100	Assignments available on Blackboard	
	•Quizzes (x3)	100	In class – (midpoint between exams)	
	•Participation	100	Based on attendance, clicker quizzes and group exercises	
	•Lab	200	From CHEM100 L	
	Total Points:	1,000		

* 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.

Your lab grade will be computed as follows:

•Formal Report and Presentation	40
•Notebook Sheets (7)	70
(Calorie, Atomic Spectra, Molecular Modeling, Soil Analysis, Solution Chemistry, Vitamin C, Titration – Aquatic Systems)	
•Data Analysis Reports (3)	90
(Measurement, Stoichiometry, Gas Laws)	
Total Points:	200

Notebook sheets are due at the **end of the lab session**.

Data Analysis (DA) reports are due on **Monday by 5:00 pm**.

Guidelines for the notebook sheets, data analysis reports, paper, and presentation will be provided on Blackboard.

Grading Scale	B+: 89.9-87.0%	C+: 79.9-77.0%	D+: 69.9-67.0%
A: 100.0-94.0%	B: 86.9-84.0%	C: 76.9-74.0%	D: 69.9-60.0%
A-: 93.9-90.0%	B-: 83.9-80.0%	C-: 73.9-70.0%	F: below 60.0%

*NOTE: Your lab grade will be added to your lecture class scores (including the final) to determine your grade for CHEM100.

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
- SF/U – 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”

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.
- You are expected to be attentive and participate in class.
- Cell phones are **NOT** allowed in class. See more information under “Participation” section.
- Laptops are only allowed in class if you have an e-textbook or it serves as your primary means of taking notes. You must request permission from me before bringing your laptop to class. If you are caught doing anything inappropriate (ie. not what is currently being done in class), this privilege will be revoked.
- You must be appropriately dressed for class and lab.

Error in Grading: If there appears to be an error in grading, submit your request for reconsideration in writing via e-mail within **48 hours** after the exam/quiz/homework is returned. Note: when you submit your graded item for a review, all of your work will be reviewed and re-graded if applicable.

Review Sessions: Regular review sessions run by the instructor will be scheduled prior to the exams. It is recommended that students who are having difficulty in class to see the instructor during the office hours for additional help.

Blackboard & Mastering Chemistry:

Blackboard will be the primary means of communication outside of class. It will also place supplementary course resources on Blackboard.

Available Resources:

- **Need help** – please come to office hours at the first sign of trouble. Tutors are also available to help you. Tutor information will be posted in Blackboard.
- **Need more problems** - the textbook "An Introduction to General, Organic, and Biochemistry" (including solutions manual) is available as a course reserve in the library (1 hr limit).

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.

Tentative Lecture Schedule

Listed in each column is chapter numbers from the text and quiz, and exam dates.

Week	Date	Tuesday	Thursday
1	Aug. 27 – 29	--	Chapter 1
2	Sept. 1 – 5	Chapter 1	Chapter 2
3	Sept. 8 – 12	Chapter 2	Chapter 2 + Q1
4	Sept. 15 – 19	Chapter 3	Chapter 3

5	Sept. 22 – 26	Chapter 3	Chapter 3
6	Sept. 29 – Oct. 3	Chapter 3	Exam 1*
7	Oct. 6 – 10	Chapter 4	Chapter 4
8	Oct. 13 – 17	Fall Break! ☺	Chapter 4 + Q2 *
9	Oct. 20 – 24	Chapter 5	Chapter 5
10	Oct. 27 – 31	Chapter 5	Exam 2*
11	Nov. 3 – 7	Chapter 6	Chapter 6
12	Nov. 10 – 14	Chapter 6	Chapter 7
13	Nov. 17 – 21	Chapter 7	Exam 3*
14	Nov. 24 – 28	Chapter 7	Thanksgiving Break! ☺
15	Dec. 1 – 5	Chapter 8	Chapter 8
16	Dec. 8 – 12	Chapter 8	Final Exam (9:30AM)

* These exam dates are flexible.

* Oct. 17th : Last day to drop

Laboratory Schedule:

Week	Expt. No.	Date	Experiment Description
1	--	Aug. 27 – 29	No Lab! ☺ Enjoy the Outdoors!
2	0	Sept. 1 – 5	Introduction + Safety video
3	1	Sept. 8 – 12	Measurement – How much Food is in a Basket?
4	2	Sept. 15 – 19	Calorie lab – Energy from Food
5	3	Sept. 22 – 26	Atomic Spectra – What Color is your Food?
6	4	Sept. 29 – Oct. 3	Molecular Modeling – Distinctive Flavors and Fragrances
7	5	Oct. 6 – 10	Stoichiometry – What is the Limiting Ingredient?
8	--	Oct. 13 – 17	** No lab (Fall Break Mon.-Tues.) **
9	6	Oct. 20 – 24	Gas Laws – Cows and Methane
10	7	Oct. 27 – 31	Organic Farm Soil Analysis (Part I)
11	8	Nov. 3 – 7	Organic Farm Soil Analysis (Part II)
12	9	Nov. 10 – 14	Solution Chemistry – Aquatic Systems (Part I)
13	10	Nov. 17 – 21	Vitamin C Titration – Aquatic Systems (Part II)
14	--	Nov. 24 – 28	** No lab (Thanksgiving Break Wed.-Fri.) **
15	11	Dec. 1 – 5	Buffer Systems – Aquatic Systems (Part III)
16	--	Dec. 8 – 12	No Lab! ☺

NOTE: The lab schedule is subject to change, depending on the pace of the course. Changes will be announced in class and posted to your class Blackboard site.

A primary focus of laboratory exercises is safety. Do not wear shorts, sandals, or loose clothing. You must always wear safety glasses while in lab. Lab will typically be carried out individually or in groups of 2-3 students. Do exercise care in picking a lab partner that you can work well with and be productive around. I will intervene and assign lab partners if I think a group is not performing in an efficient manner.

Listed below are a few details that pertain to lab reports and the lab notebook.

- A report is considered late if submitted after 4:00 PM on the due date. Late assignments are docked 50% per day. Any assignment turned in 2 days after the due date will receive a zero.
- A carbon-copy laboratory notebook provides a place for the recording of your work taking place in the experiments. It should contain a brief purpose statement for the experiment, pertinent equations and literature values needed, experimental modifications and observations, organized data tables for recording experimental results, and complete calculations showing the reported results. Lastly, include any needed error analysis or a few statements as to the estimated error for a given experiment. The laboratory notebooks will be graded, so be sure to maintain them properly.