CHEMISTRY 100 - Fall 2014

Instructor: Sean J. Mo, Ph.D. **Office:** Pierce 122A **Phone**: 770-484-4514 **E-mail:** sean.mo@emory.edu

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

Office hours: Mon: 3:30-5:00p, Tue: 3:30-5:00p, Wed: 4:00-5:00a and Fri: 10:00a-12:00p and by appointment

Text and Materials:

Class

- *Introduction to General, Organic and Biochemistry,* 10th ed. by Bettelheim, et. al. (Required)
- A *non-programmable* scientific calculator that can handle power-of-ten scientific notation for numbers (Required)
- An open mind, willingness to learn, and dedication. (Definitely Required)

Laboratory

- Laboratory experiment handouts – provided in class (Required)
- Carbon-copy lab notebook – sold at the Oxford bookstore (Required)
- Approved safety glasses (Available for purchase in class)

} Have all three items for lab before your first lab.

Course Description: In this course you will explore introductory topics in chemistry. The topics covered in the course range from the classification of matter, conversion of units, significant figures, concept of mole, stoichiometry, the structure of the atom, nomenclature, determination of molecular structure, reactions in aqueous solution, molarity, gases, acid-base reaction, pH of a solution, reaction rates, quantum theory and electromagnetic radiation, electron configurations, the periodic table, bonding and other fundamental chemistry topics.*

In order to connect the individual topics to how we experience them in the real world, the overall theme for this course is set as *Sustainability through Science*. More specifically, chemistry topics related to the sustainability practices related to food, medicine and our daily lives will be examined throughout the course.** This interdisciplinary exploration approach will assist with applications of individual chemistry topics to tangible examples and case studies.

Learning Outcomes: At the conclusion of this course, the students will have gained expertise in both quantitative and qualitative problem solving. Also, the students will be able to ask critical questions related to the real world issues such as sustainability practices related to food, medicine and society. Furthermore, the laboratory component of the course will give the students the necessary hands-on skills to master the chemistry applications related to aforementioned topics.

* Comprehensive topics list is available on Blackboard.
** Rest assured, after the completion of the course, you will gain the fundamental chemistry knowledge that can be transferred to other natural science and nursing majors. ☺

Class: This class will utilize lecture, discussion, group work and laboratory experiences to enhance the students understanding of the materials covered. In this course, when needed, additional lecture materials will be posted on the class Blackboard site, or handed out in class. The purpose of posting the lectures and handing out the crucial lecture material is to allow you to listen to the lecture and class discussion. It is not to allow you to skip class and assume that you can learn everything from the posted lectures. As you will see, everything that we do in class is not posted on the web.

Assignments: Problems will be assigned in class. These problems will not be collected or graded. However, you will be required to bring solved problems and participate in the class discussion. Furthermore, it will be beneficial for you to work through as many problems as possible to master the topics. As the old adage goes, "practice makes perfect." Personally, I prefer, "*le hasard ne favorise que les esprits prepares*" by Louis Pasteur.

Laboratory: Laboratory attendance is **mandatory**. Make-up labs are not provided.* First missed lab will result in a zero point for the experiment. The second missed lab results in a drop of your *overall* course grade by a full letter grade. At your first lab meeting, the lab procedure will be explained to you. *Exemptions are provided for medical, religious, and special reasons.

Participation: Prompt attendance is expected at every class meeting. Your participation grade will be largely based on your attendance and group discussion/problem solving.

** Please do not use your mobile/smart phone during 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 for the first time, you will be given **a**

Proper Behavior in Class: Class is a learning environment; expected behavior includes:

- Coming to class on time and being attentive in class.
- Participating in class.
- Not going in and out of class (unless you're sick) – please get a drink or use the restroom before or after class.
- Not eating or drinking in class. Water bottles are acceptable.
- Not working on material for another class.
- Not bringing a laptop computer to class. If there is a reason you need a computer to assist you in class, make arrangements with me.
- Bringing your textbook and all handouts to each class.

Not respecting the learning environment in class can affect your grade and future recommendations.

Attendance:

- Students are expected to attend all class meetings. However emergencies can arise which may result in absence from class. It would be a good idea to notify me if an absence is due to illness or other emergency. You are responsible for all material covered if absent.

- You are allowed 3 absences in class. If you exceed the 3 absence limit for any reason, by any combination of absences or tardies, you will:

  (a) Lose 3 points for the next 2 absences (numbers 4 and 5);
  (b) Lose 4 points for each additional absence (numbers 6 and up).

These points will be deducted from the final average. Note that there are no "excused" absences.

- Besides missing class, these also count as an absence:

1. Being late to class TWICE. (This means coming in after I've finished checking the class roster.) If you come in late, it is your responsibility to see me immediately after class to ensure that you are marked as being tardy and not absent. No adjustments will be made at a later time.
2. Coming to class more than 15 minutes late
3. Leaving class early
4. Going in and out of class
5. Being inattentive in class or working on other assignments in class

Quizzes: There will be four (4) quizzes throughout the semester to reinforce the contents covered in class. The quizzes will take place at the beginning of the class on assigned days. Quiz dates will be announced in class. There will NOT be make-up quizzes. Your top three quiz scores will be counted towards your overall quiz score. Your lowest quiz score will not count towards your final quiz score.

Exams: There will be three (3) 80-minute exams in class throughout the semester. There will NOT be make-up exams regardless of the reason an exam was missed. If you miss an exam and present me with an acceptable excuse, the grade on the final exam will count in place of the missed exam grade. You must notify me by the day and starting time of the exam that you will not be present and you must give me the reason for the absence. If the excuse is not considered acceptable, the exam grade will be a zero.

In general, illness or an emergency situation is the only acceptable excuses for missing an exam. If you are going to miss an exam for a religious holiday or for a school-related activity, you must make arrangements to take the exam early. Missing an exam also counts as an absence in the course. The grade on the final exam can only replace one missed exam; additional missed exams will receive a grade of zero.

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.

Schedule:

Ch. 1	Ch. 5
Ch. 2 + Atomic Spectrum and EM Radiation	Ch. 6
Ch. 3	Ch. 7
Ch. 4	Ch.8

Note that this schedule is subject to change. The sections covered for each exam will be announced in class.

Grading:

Items	Points	Date	Materials Covered
• Exam 1	120	Oct. 2nd, 2014 (Thur.) 12:00-1:20p	Exam Topics 1 (Ch.1 & 2)
• Exam 2	120	Oct. 30th, 2014 (Thur.) 12:00-1:20p	Exam Topics 2 (Ch.3 & 4)
• Exam 3	120	Nov. 20th, 2014 (Thur.) 12:00-1:20p	Exam Topics 3 (Ch.5 & 6)
• Final Exam*	240	Dec. 17th, 2014 (Wed.): 09:00-12:00	Final Exam Topics (Ch. 1 – 8)
• Quizzes (x4)	100	in class – (midpoint between exams)	
• Participation	100	based on attendance, individual and group assignments	
• Lab	200	From CHEM100L	
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.

Lab Grade will be computed as follows:

• Notebook Sheets (Top 10 of 11 scores) (Measurements, Calorie, Molecular Modeling, Flavor and Fragrance, Gas Laws, Soil Analysis I & II, and Aquatic Systems I, II & III)	100
• Data Analysis Reports (5) (Measurements, Calorie, Stoichiometry, Soil Analysis, Aquatic Systems)	100
Total Points:	200

Notebook sheets are due at the **end of each lab session**.
Data Analysis reports are due on assigned **Mondays by 4:00 pm.**
Guidelines for the notebook sheets, data analysis reports are available on Blackboard.

Course Grading Scale

A: 100.0-95.0%	B+: 89.9-87.0%	C+: 79.9-77.0%	D+: 69.9-67.0%
A-: 94.9-90.0%	B: 86.9-84.0%	C: 76.9-74.0%	D: 69.9-60.0%
	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. Your exam average AND your lab average must both be passing (60 or higher) or you will receive a grade of F in the course regardless of your final numerical average.*

Feedback

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

CALC – calculation error
CNPT – inadequate understanding of concept
CVSN – problems with conversion factor
FMLA – incorrect formula or wrong use of formula
SF / U – problems with significant figures and/or units

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

"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:

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.

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.

Honor Code:

It is assumed that all Oxford College students will adhere to the highest standards of academic honesty and will uphold the Oxford College Honor Code.

On exams, you may not use any material not distributed with the exam itself except for your own calculator and pencils/pens. You may not have any other material with you – this includes books, notebooks, book bags, papers, etc.; they must be left at the front of the room. You may not have a cell phone or other electronic device with you; if you bring these, they must be left at the front of the room also (and must be turned off). During an examination, you may not give or receive assistance. On assignments for outside class (essays, lab reports), the work is to be your work alone – you may not give or receive any assistance, and you may use only materials authorized. Since absences and tardies can affect your grade, giving false information regarding absences or tardies is a violation of the Honor Code. Note also that the Oxford College Honor Code expects students to report any violations of the Code they know of. See the Honor Code Pledge handout for more information.

Laboratory Schedule:

All laboratory sessions are scheduled from 2:30-5:30pm on Thursday/Friday. All sessions will fully utilize **3-hours** as listed on the schedule. Please consult with the instructor if you *cannot* meet the attendance requirement.

Week	Expt. No.	Date	Experiment Description
1	--	Aug. 27 – 29	No Lab! ☺ Enjoy the Outdoors!
2	0	Sept. 1 – 5	Introduction + Safety video + Case Study
3	1	Sept. 8 – 12	Measurement lab – How much Food is in a Basket?
4	2	Sept. 15 – 19	Calorie lab – Energy from Food
5	3	Sept. 22 – 26	Molecular Modeling – Common Compounds
6	4	Sept. 29 – Oct. 3	Flavors and Fragrances
7	5	Oct. 6 – 10	Stoichiometry – What is the Limiting Ingredient?
8	--	Oct. 13 – 17	Organic Farm Soil Analysis (Part I)
9	6	Oct. 20 – 24	Organic Farm Soil Analysis (Part II)
10	7	Oct. 27 – 31	** No lab **
11	8	Nov. 3 – 7	Gas Laws – Cows and Methane
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: Lab handouts are available on Blackboard. Be sure to download them prior to coming into the lab.

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 25% per day. Any assignment turned in 3 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.