

**LAGUARDIA COMMUNITY COLLEGE  
CITY UNIVERSITY OF NEW YORK  
NATURAL SCIENCES DEPARTMENT**

**SCC 110: Foundations of Chemistry**

**Fall I 2017**

**Your Instructor's Name:** \_\_\_\_\_

**Instructor's E-mail:** \_\_\_\_\_

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**Course Description:**

This course presents essential facts, laws and theories of general chemistry. Topics include measurement and significant figures, atomic structure, elements and compounds, chemical reactions, stoichiometry, solutions, acid and bases, classification of simple organic compounds according to functional groups and biologically important molecules such as carbohydrates, lipids and proteins. The laboratory component is designed to illustrate the fundamental laws and techniques of general chemistry. The course addresses the needs primarily of allied health students.

**Prerequisites:** CSE099, ENA/ENG099, MAT096/MAB096

**Textbook:** *General, Organic, and Biological Chemistry: Structures of Life*, 5<sup>th</sup> Edition (Pearson Co, 2015)  
3<sup>rd</sup> Custom Edition by Karen C. Timberlake (Pearson Custom Publishing, 2015)

**Laboratory Manual:** *Catalyst Lab Manual for SCC 110* by N.S. Hussain (Pearson Custom Publishing, 2015)

**Study Guide (optional):** *Study Guide with Selected Solutions*, by Karen C. Timberlake (Pearson, 2013)

**Safety Glasses:** All students are required to provide their own ANSI approved- safety glasses or goggles (available in the Bookstore or any hardware store) for laboratory work.

**Scientific Calculator:** All students are required to have their own personal scientific calculators. *Borrowing calculators during a quiz or exam is **not** allowed.*

**Academic Integrity Policy:** Instructors of this course are required to implement the College Policy regarding cheating on examinations and quizzes. A complete statement of the policy is available at the student counseling services.

**Attendance Policy:** Attendance at all class sessions, lecture and laboratory, is essential for proper understanding and mastery of the course material. A student who is absent from more than one laboratory session seriously jeopardizes his/her grade for the course.

**Grading Scheme:** Student performance will be evaluated in the following ways:

Exams (3)	300 points
Final Departmental Exam	200 points
Homework Assignments (10) @ 15 pts	150 points
Laboratory Reports (10) @ 20 pts	200 points
Pre-lab Quizzes (10) @ 5pts	50 points
Laboratory Final Exam	100 points
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Total:	1000 points

A minimum of 600 points (60% of 1000) is required in order to receive a passing grade for the course.

**Grading Scheme:**

A = 93-100 %	C+ = 77-79.9 %	
A- = 90-92.9 %	C = 73-76.9 %	
	C- = 70-72.9 %	F = less than 60%
B+ = 87-89.9 %	D+ = 67-69.9 %	
B = 84-86.9 %	D = 63-66.9 %	
B- = 80-83.9 %	D- = 60-62.9 %	

**Homework:** There will be ten homework assignments assigned by the instructor throughout the semester. **All students must register with Sapling Learning for Homework assignments at [www.saplinglearning.com](http://www.saplinglearning.com). Without prior registration students will not have the access to HW!**

After each chapter section, there are solved Sample Problems. These are followed by practice exercises and review questions. It is helpful to practice with these before attempting the Questions and Problems at the end of the chapter. Answers to selected review questions, practice exercises and odd-numbered problems in the chapter are given in the Appendix of the text.

**Guidelines for Homework Assignments:**

- 1) Homework is all done on-line using the Sapling-Learning Program.
- 2) There will be 10 HW assignments (Total 150 Points).
- 3) The Homework deadline will be shown after each assignment.
- 4) Late assignments will not be accepted.

**Make-up Policy:** There will be no scheduled make-up exams. A student who has missed an exam (due to emergency only!!) should consult the instructor on the matter within the week after missing the exam.

## **Instructional Objectives:**

1. Introduce students to measurements of length, mass, volume, and temperature of a substance with the correct number of significant figures and illustrate the importance of measurements in daily life and health-related disciplines.
2. Introduce students to the principles of atomic structure, physical and chemical properties of matter, isotopes, the Periodic Table, and the electron configuration of elements.
3. Familiarize the students with the types of chemical bond, the Octet rule, and Lewis structures.
4. Explain the rules of writing and naming chemical formulas of compounds.
5. Reinforce the students' knowledge of energy and energy transfer accompanying changes of state.
6. Introduce students to chemical reactions, types and balancing chemical equations.
7. Describe the factors that affect the rate of chemical reactions.
8. Introduce the concept of chemical equilibrium and Le Chatelier's Principle.
9. Introduce chemical quantities: Avogadro's number, formula mass, mole, molar mass and illustrate how to do the calculations involving these quantities.
10. Explain the kinetic molecular theory of gases, Boyle's Law, Charles' Law, Avogadro's Law, Gay-Lussac's Law, and Ideal Gas Law, and how these laws are used in solving problems.
11. Introduce the students to the principles of solution formation, electrolytes, and nonelectrolytes and to the different ways expressing concentration of solutions.
12. Introduce the students to the concepts of acids, bases, pH, buffers.
13. Describe the differences between organic and inorganic compounds and familiarize them with the classification of organic compounds according to functional groups.
14. Introduce the structure of carbohydrates, proteins and lipids.
15. Familiarize the students with laboratory techniques that integrate computer technologies.

## **Science Study Center - E342:**

A variety of learning aids are available in the Science Study Center. Visit the Center at your first opportunity to see how it can be of use to you. This is also where tutoring for the course will be available at the times indicated on the door.

Notes:

**2017 FALL SEMESTER – SESSION I**

**For Important dates look at the college Academic Calendar**

Week 1	:	Chapter 2 (Chemistry and Measurements), Chapter 3 (Matter and Energy)	
Week 2	:	Chapter 3 (Matter and Energy), Chapter 4 (Atoms)	<u>Homework # 1</u>
Week 3	:	Chapter 6 (Ionic and Molecular Compounds)	<u>Homework # 2,</u>
Week 4	:	Chapter 6 (Ionic and Molecular Compounds), Chapter 7 (Chemical Reactions and Quantities)	
		<b>Exam #1 (Chapter 2, 3, 4, and 6)</b>	<u>Homework # 3</u>
Week 5	:	Chapter 7 (Chemical Reactions and Quantities)	<u>Homework # 4</u>
Week 6	:	Chapter 8 (Gases), Chapter 9 (Solutions)	<u>Homework # 5</u>
Week 7	:	Chapter 9 (Solutions), Chapter 10.1 (Reaction Rates and Chemical Equilibrium)	
Week 8	:	Chapter 10.2 and 10.5 (Reaction rates and Chemical Equilibrium)	<u>Homework # 6</u>
		<b>Exam #2 (Chapters 7, 8 and 9)</b>	
Week 9	:	Chapter 11 (Acids and Bases),	<u>Homework # 7</u>
Week 10	:	Chapter 11 (Acids and Bases) Chapter 12 (Introduction Organic Chemistry, alkanes, alkenes)	<u>Homework # 8</u>
Week #11	:	Chapter 12 (Introduction to Organic Chemistry: Alkynes, Arenes, Functional groups) Chapter 13.1 – 13.2 (Alcohols, Phenols, and Ethers, Chapter 14.1 (Aldehydes and Ketones), 16.1, 16.4 (Carboxylic Acids and Esters)	
		<b>Exam # 3 (Chapters 10-14, and 16)</b>	<u>Homework # 9</u>
Week #12	:	Chapter 15.1, 15.5, 15.6 (Carbohydrates), Chapter 17.1-17.2 (Lipids) Chapter 19.1, 19.3-19.5 (Amino Acids and Proteins)	<u>Homework #10</u>
Week 13	:	<b>Final Exam (Cumulative, Dept. Final Exam)</b>	

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Week 1:	Introduction to the Lab; Safety Film, Check-in
Week 2:	Density and Specific Gravity
Week 3:	Energy and Matter
Week 4:	Molecular Shapes
Week 5:	Chemical Reactions and equations
Week 6:	Formula of a Hydrate
Week 7:	Back and Forth- Reversible Reactions and Equilibrium
Week 8:	Acids, Bases, pH and Buffers
Week 9:	Acid-Base Titration
Week 10:	Reaction of Hydrocarbons
Week 11:	Carbohydrates, Proteins, Fats and Oils
Week 12:	<b>Lab Final Exam</b>

**Before the first working session (week #2)** in the laboratory, each student **must** do the following:

- (1) View the Laboratory Safety Video;
- (2) Check into a drawer assigned by the Laboratory Instructor;
- (3) Complete and hand in the Safety Commitment;
- (4) Read pages 1-13 of the Laboratory Manual
- (5) Provide him/herself with a pair of Safety Goggles.

Items (1) and (2) above are generally accomplished in the laboratory during the first week of classes. The Safety Commitment can be handed in at the beginning of the first working session in the laboratory. Goggles must be brought to the first working session in the laboratory.

If a student is not present for the initial laboratory session, it is the student's responsibility to obtain an authorization form from the Laboratory Instructor or from the Laboratory Technician for viewing of the Safety Film in the Library. The student must then present the form with the proper verification that he or she has seen the Laboratory Safety Video at the next laboratory session.

Students who have attempted the course in the past and state that they have seen the safety video previously **are not exempt** from provision (1) above.

**Always maintain a clean work area in the lab. It is difficult to do organized work in a disorderly setting. At the end of each lab work, put away all equipment and clean your work area.**

**NOTE:** *4-5 points* will be taken from your experiment grade for failing to follow the above stated policy.

### **Pre Lab Quizzes:**

The pre-lab quizzes will be based on the pre-lab assignments listed in the appendix of the lab manual. Thus it will be of great benefit to you to answer the assigned pre-lab questions before coming to the laboratory. The pre-lab quizzes will be given **before** experimental work begins.