LAGUARDIA COMMUNITY COLLEGE
 CITY UNIVERSITY OF NEW YORK
 NATURAL SCIENCES DEPARTMENT

**SCC 110: Foundations of Chemistry Fall II 2020**

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

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

**Office Hours: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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Chemistry Program Coordinator: Dr. Janet Gonzalez

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**THE FOLLOWING SYLLABUS APPLIES ONLY TO SCC 110 SECTION 724A and 724B**

**For SCC 110 Distant Learning the Minimum Requirements are:**

High Speed Internet (eg. No Dial up internet)

Laptop or Desktop computer with audio capabilities to communicate

Access to BlackBoard

LaGCC email

**Testing:**

**FOR THIS SPECIFIC SCC 110 DISTANT LEARNING SECTION ONLY**

**Lecture Exams 1, 2, 3 and Final cumulative exam will be conducted via \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Laboratory Prelab quizzes and the lab final exam will be conducted via \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**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 (required): The Basics of GOB Chmeistry (Ball et. al)- online textbook (FREE to download)**

[https://chem.libretexts.org/Bookshelves/Introductory\_Chemistry/Book:\_The\_Basics\_of\_GOB\_Chemistry\_(Ball\_et\_al.)](https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Book%3A_The_Basics_of_GOB_Chemistry_%28Ball_et_al.%29)

**Textbook (Optional)**: General, Organic, and Biological Chemistry: Structures of Life, 6th Edition (Pearson Co, 2019) 3rd Custom Edition by Karen C. Timberlake (Pearson Custom Publishing, 2015).

**Laboratory Manual:** Handouts for all 10 laboratory experiments will be available on blackboard. You need to download the material from there for your study as well as to write your lab reports.

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

**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) The Homework deadline will be shown after each assignment.

3) 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, Avogardro’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.

**Fall II, 2020 SCC 110 Class Schedule**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course & Section** | **Days** | **Time** | **Room #** | Instructor |
| SCC 110. 723A 723B | M, W (Lec)Tu, Th (Lab) | 3:25 PM - 6:45 PM3:25 PM – 6:45 PM  | OnlineOnline | S. Singh |
| S. Singh |
| SCC 110. 724A 724B  | M, W (Lec)M, W (Lab) | 11:45 AM – 3:15 PM8:00 AM – 11:30 PM  | OnlineOnline | A. Aggarwal |
| A. Aggarwal |
| SCC 110. 725A 725B | M, W (Lec)Tu, Th (Lab) | 8:00 AM – 11:30 AM8:00 AM –11:30 AM  | OnlineOnline | P. Rathod |
| P. Rathod |
| SCC 110. 736A 736B | Tu, Th (Lec)Tu, Th (Lab) | 11:45 AM – 3:25 PM8:00 AM –11:30 AM  | OnlineOnline | S. Bodapati |
| S. Bodapati |
| SCC 110. 737A 737B  | Tu, Th (Lec)M, W (Lab) | 3:25 PM - 6:45 PM3:25 PM –6:45 PM | OnlineOnline | R. R. Chamala |
| J. Appawu |
| SCC 110. 814A 814B | M, W (Lec)Tu, Th (Lab) | 5:45 PM – 9:05 PM6:55 PM – 10:15 PM | OnlineOnline | S. Ponnala |
| A. Aggarwal |
| SCC 110. 815A 815B | Tu, Th (Lec)Sa (Lab) | 5:45 PM – 9:05 PM9:15 AM - 4:25 PM | OnlineOnline | H. Sultana |
| H. Sultana |

Notes:

##  2020 FALL SEMESTER – SESSION II

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| **Day** | **Month** | **Information** |
| Sunday | January 3 | Last day to drop for 100% tuition refund |
| **Monday** | **January 4** | **First day of Weekday classes – Fall Session II** |
| Tuesday | January 5 | Last day to add a course or change course sections / Last day to submit Independent study contract |
| Thursday | January 7 | Course withdrawal drop “WD” period begins |
| Friday | January 8 | Last day to drop for 50% Tuition Refund |
| **Saturday** | **January 9** | **First day of Saturday classes – Fall Session II** |
| **Sunday** | **January 10** | **First day of Sunday classes – Fall Session II** |
| Tuesday | January 12 | Last day to drop for 25% tuition refund / Course withdrawal drop “WD” period ends / Verification of Enrollment Rosters due to the Registrar to assign WN grades |
| Wednesday | January 13 | **Withdrawal period begins** |
| **Monday** | **January 18** | **College Closed** |
| Wednesday | January 20 | Irregular day – Classes follow Monday schedule |
| Tuesday | February 9 | Irregular day – Classes follow Friday schedule |
| **Friday** | **February 12** | **College Closed** |
| **Saturday** | **February 13** | **Last day of Saturday classes – Fall Session II** |
| **Monday** | **February 15** | **College Closed** |
| **Wednesday** | **February 17** | **Withdrawal period ends / Last day of Weekday classes – Fall Session II** |
| Thursday | February 18 | Reading Day |
| **Friday – Wednesday** | **February 19 – 24** | **Final Examinations / End of Fall 2020 Term** |
| Friday | February 26 | Grades and Attendance Due by 4 PM |

**SCC110 Tentative Lecture Outline Fall II, 2020**

**Tentative Lecture Outline based on the Libretext “The Basics of gOB Chemistry” by Ball et.al on-line textbook**

**Week 1 Chapter 1: Chemistry, Matter and Measurement**

1.2 The Classification of Matter

 1.3 Measurements

1.4 Expressing Numbers- Scientific Notation

 1.5 Expressing Numbers- Significant Figures

1.6 The International System of Units

 1.7 Converting Units

 1.8 Dosage Calculations

Week 1 **Chapter 7: Energy and Chemical Processes**

 7.1 Energy and Its Units

 7.2: Heat and Temperature

 7.3: Phase Changes

 **Chapter 2: Elements, Atoms, and The Periodic Table**

2.1 The Elements

2.2 Atomic Theory

**Week 2**  2.3 The Structure of Atoms

 2.4 Nuclei of Atoms

 2.5 Atomic Masses

 2.6 Arrangement of Electrons

 2.7 The Periodic Table

 **Chapter 3: Ionic Bonding and Simple Ionic Compounds**

3.1 Two Types of Bonding

 3.2 Ions

 3.3 Formula for Ionic Compounds

 3.4 Ionic Nomenclature

 3.5 Formula Mass

 3.6 Characterstics of Ionic Compounds

**Week 2 Chapter 4: Covalent Bonding and Simple Molecular Compounds**

4.1 Covalent Bonds

 4.2 Covalent Compounds- Formulas and Names

 4.3 Drawing Lewis Structures

 4.4 Characteristics of Covalent Bonds

 4.5 Characteristics of Molecules

 **Chapter 5: Introduction to Chemical Reactions**

 5.1 The Law of Conservation of Matter

 5.2 Chemical Equations

 5.3 Quantitative Relationships Based on Chemical Equations

 5.4 Some Types of Chemical Reactions

 5.5 Oxidationn-Reduction (REDOX) Reactions

 **Exam 1 (Chapters 1,2,3,4 and 7)**

**Week 3** **Chapter 6: Quantities in Chemical Reactions**

 6.1 The Mole

 6.2 Atomic and Molar Masses

 6.3 Mole-Mass Conversions

 6.4 Mole-Mole Relationships in Chemical Reactions

 6.5 Mole-mass and Mass-Mass Problems

**Week 3** **Chapter 8: Solids, Liquids, and Gases**

 8.1 Intermolecular Interactions

 8.3 Gases and Pressure

 8.4 Gas Laws

**Week 4**  **Chapter 9: Solutions**

 9.1 Solutions

 9.2 Concentration

 9.3 The dissolution Process

 9.4 Properties of solutions

 9.5 Chemical Equilibrium

 9.6 Le Chatelier’s Principle

 9.7 Osmosis

**Week 4**  **Chapter 10: Acids and Bases**

 10.1 Arrhenius Definition of Acids and Bases

 10.2 Brønsted-Lowry Definitions of Acids and Bases

 10.3 Water Both and Acid and a Base

 10.4 The strengths of Acids and Bases

 10.5 Buffers

**EXAM 2 (Chapters 5,6,8, and 9)**

**Week 5**  **Chapter 12: Organic Chemistry- Alkanes and Halogenated Hydrocarbons**

 12.1 Organic Chemistry

 12.2 Branched-Chain Alkanes

 12.3 Structures and Names of Alkanes

 12.4 Condensed Structural and Line-Angle Formulas

 12.5 IUPAC Nomenclature

12.8 Halogenated Hydrocarbons

12.9 Cycloalkanes

 **Chapter 13: Unsaturated and Aromatic Hydrocarbons**

 13.1 Alkenes- Structures and Names

 13.2 Cis-Trans Isomers (Geometric Isomers)

 13.4 Chemical Properties of Alkenes

 13.6 Alkynes

 13.7 Aromatic Compounds- Benzene

  **Week 5**  **Chapter 14: Organic Compounds of Oxygen**

 14.1 Organic Compounds with functional Group

 14.2 Alcohols- omencleture and Classification

 14.8 Ethers

 14.9 Aldehydes and Ketones- Structures and Names

**Week 6**  **Chapter 15: Organic Acids and Bases and Some of Their Derivatives**

 15.1 Carboxylic Acids- Structures and Names

 15.5 Esters- Structure and Names

 15.10 Amines- Structure and Names

 15.13 Amides- Structure and Names

 **Exam 3 (Chapters 10, 12, 13, 14, and 15)**

 **Chapter 16: Carbohydrates**

 16.1 Carbohydrates

 16.2 Classes of Monosaccharides

 16.6 Disaccharides

 16.7 Polysaccharides

**Week 6 Chapter 17: Lipids**

17.1 Fatty Acids

 17.2 Fats and Oils

 **Chapter 18: Amino Acids, Proteins and Enzymes**

 18.1 Properties of Amino Acids

 18.2 Reactions of Amino Acids

 18.3 Peptides

 18.4 Proteins

**Week 7** **CUMULATIVE FINAL EXAM**

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**SCC 110 Laboratory Experiment Schedule Fall II, 2020**

 Week 1: Introduction to the Lab; Safety Film, Check-in

 Week 1: Density and Specific Gravity

 Week 2: Energy and Matter

 Week 2: Molecular Shapes

 Week 3: Chemical Reactions and Chemical Equations

 Week 3: Formula of a Hydrate

 Week 4: Reactions Rate and Chemical Equilibrium

 Week 4: Acids, Bases, pH and Buffers

 Week 5: Acid-Base Titration

 Week 5: Reaction of hydrocarbons

 Week 6: Carbohydrates, Proteins, Fats and Oils

 Week 6: **Lab Final Exam**

**SCC 110 Laboratory Requirements Falls II, 2020**

 **Before the first working session (week #1)** 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.**

***4-5 points*** may be taken from your experiment grade for failing to observe this policy.

# Pre / Post 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.