MLAB 1291

SPECIAL TOPICS IN MEDICAL LABORATORY TECHNOLOGY

(CHEMISTRY SECTION)

FALL 2016

COURSE INFORMATION:
MLAB 1291 – Special Topics in MLT – Chemistry Section
Lecture Hours per Week - 1
Laboratory Hours per Week – 4
Placement: Fall semester. Freshman year.

PROFESSOR INFORMATION:
Instructor Name: Alan Jackson
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PREREQUISITES:
MLT Majors:
1. Admission to the MLT-AD Program
2. Consent of the MLT Program Director

COURSE DESCRIPTION:

MLAB 1291. Special Topics: Microbiology, Chemistry and Math for Medical Laboratory Science, 2 credit hours. An introductory study to include fundamental microbiology concepts and skills, basic mathematics, and elementary chemistry as they apply specifically to medical laboratory science.

LEARNING OBJECTIVES:

CHAPTER 1 Introduction to Chemistry
1.1 Evolution of Chemistry
- To describe the early practice of chemistry.
- To identify the three steps in the scientific method.

1.2 Modern Chemistry
- To describe the modern practice of chemistry.

1.3 Learning Chemistry
- To appreciate that chemistry is interesting and relevant.

CHAPTER 3 Matter and Energy
3.1 Physical States of Matter
- To describe the motion of particles in the solid, liquid, and gaseous states of matter.
- To describe the motion of particles in the solid, liquid, and gaseous states of matter.

3.2 Elements, Compounds, and Mixtures
- To classify a sample of matter as an element, compound, or mixture.

3.3 Names and Symbols of the Elements
- To relate the names and symbols of 48 common elements.

3.4 Metals, Nonmetals, and Semimetals

- To distinguish between the properties of metals and nonmetals.
- To predict whether an element is a metal, nonmetal, or semimetal given its position in the periodic table.
- To predict whether an element is a solid, liquid, or gas at 25 °C and normal atmospheric pressure.

3.5 Compounds and Chemical Formulas

- To state the number of atoms of each element in a compound given the chemical formula.
- To apply the law of definite composition to a compound.

3.6 Physical and Chemical Properties

- To classify a property of a substance as physical or chemical.

3.7 Physical and Chemical Changes

- To classify a change in a substance as physical or chemical.

3.8 Conservation of Mass

- To apply the conservation of mass law to chemical changes.

3.9 Potential and Kinetic Energy

- To distinguish between potential and kinetic energy.
- To relate kinetic energy, temperature, and physical state.

3.10 Conservation of Energy

- To apply the conservation of energy law to physical and chemical changes.
- To identify the following forms of energy: chemical, electrical, mechanical, nuclear, heat, and light.

CHAPTER 4 Models of the Atom

4.1 Dalton Model of the Atom

- To describe the Dalton model of the atom.

4.2 Thomson Model of the Atom

- To describe the Thomson plum-pudding model of the atom.
- To state the relative charge on an electron and a proton.

4.3 Rutherford Model of the Atom

- To describe the Rutherford nuclear model of the atom.
- To state the relative charge and approximate mass of an electron, proton, and neutron.

4.4 Atomic Notation

- To indicate protons, neutrons, and electrons for a given atomic notation.
- To indicate the number of neutrons in a given isotope.

4.5 Atomic Mass

- To explain the concept of relative atomic mass.
- To calculate the atomic mass of an element given the mass and abundance of the naturally occurring isotopes.

4.6 The Wave Nature of Light

- To state the relationship of wavelength, frequency, and energy of light.

4.7 The Quantum Concept

- To explain the quantum concept applied to matter and energy.

4.8 Bohr Model of the Atom

- To describe the Bohr model of the atom.
- To explain the relationship between energy levels in an atom and lines in an emission spectrum.

4.9 Energy Levels and Sublevels

- To state each sublevel within a given energy level.
- To state the number of electrons that can occupy a given sublevel or energy level.

4.10 Electron Configuration

- To list the order of sublevels according to increasing energy.
- To write the predicted electron configurations for selected elements.

4.11 Quantum Mechanical Model of the Atom

- To state the relative size, shape, and energy of s and p orbitals.
- To state the number of electrons that can occupy a given orbital.

CHAPTER 5 The Periodic Table

5.1 Classification of Elements

- To apply the original periodic law proposed by Mendeleev.

5.2 The Periodic Law Concept

- To apply the modern periodic law proposed by Moseley.

5.3 Groups and Periods of Elements

- To classify the elements according to their groups (families) and periods (series) in the periodic table.
- To designate a group of elements in the periodic table using both the American convention (IA–VIIIA) and the IUPAC convention (1–18).

5.4 Periodic Trends

- To describe the trend in metallic character within a group or period.
- To describe the trend in atomic size within a group or period.

5.5 Properties of Elements

- To predict a physical property for an element given the values of other elements in the same group.
- To predict a chemical formula for a compound given the formulas of other compounds containing an element in the same group.

5.6 Blocks of Elements

- To predict the highest energy sublevel for an element given its position in the periodic table.
- To predict the electron configuration for an element given its position in the periodic table.

5.7 Valence Electrons

- To predict the number of valence electrons for any representative element.

5.8 Electron Dot Formulas

- To draw the electron dot formula for any representative element.

5.9 Ionization Energy

- To state the general trends of ionization energy in the periodic table.
- To state the group with the highest and the lowest ionization energy.
- To predict the element in a pair having the higher ionization energy.

5.10 Ionic Charges

- To predict the ionic charge for any representative element.
- To write the predicted electron configuration for selected ions.

CHAPTER 6 Language of Chemistry

6.1 Classification of Compounds

- To classify a compound as a binary ionic, a ternary ionic, or a binary molecular compound.
- To classify an acid as a binary acid or a ternary oxyacid.
- To classify an ion as a monoatomic cation, a monoatomic anion, a polyatomic cation, or a polyatomic anion.

6.2 Monoatomic Ions

- To write systematic names and formulas for common monoatomic ions.
- To predict the ionic charge for ions of representative elements.

6.3 Polyatomic Ions

- To write systematic names and formulas for common polyatomic ions.

6.4 Writing Chemical Formulas

- To write chemical formulas for ionic compounds composed of monoatomic ions and polyatomic ions.

6.5 Binary Ionic Compounds

- To write systematic names and formulas for binary ionic compounds.
- To predict the chemical formulas for binary ionic compounds.

6.6 Ternary Ionic Compounds

- To write systematic names and formulas for ternary ionic compounds.
- To predict the chemical formulas for ternary ionic compounds.

6.7 Binary Molecular Compounds

- To write systematic names and formulas for binary molecular compounds.

6.8 Binary Acids

- To write systematic names and formulas for binary acids.

6.9 Ternary Oxyacids

- To write systematic names and formulas for ternary oxyacids.

CHAPTER 7 Chemical Reactions

7.1 Evidence for Chemical Reactions

- To state four observations that are evidence for a chemical reaction.

7.2 Writing Chemical Equations

- To identify seven elements that occur naturally as diatomic molecules: H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2.
- To write a chemical equation from the description of a chemical reaction.

7.3 Balancing Chemical Equations

- To write balanced chemical equations.

7.4 Classifying Chemical Reactions

- To classify a chemical reaction as one of the following types: combination, decomposition, single replacement, double replacement, or neutralization.

7.5 Combination Reactions

- To write a balanced equation for the reaction of a metal and oxygen gas.
- To write a balanced equation for the reaction of a nonmetal and oxygen gas.
- To write a balanced equation for the reaction of a metal and a nonmetal.

7.6 Decomposition Reactions

- To write a balanced equation for the decomposition of a metal hydrogen carbonate.
- To write a balanced equation for the decomposition of a metal carbonate.
- To write a balanced equation for the decomposition of a compound that releases oxygen gas.

7.7 The Activity Series Concept

- To predict whether a metal reacts in an aqueous salt solution.
- To predict whether a metal reacts in an aqueous acid.
- To predict whether a metal reacts in water at 25 °C.

7.8 Single-Replacement Reactions

- To write a balanced equation for the reaction of a metal in an aqueous solution.
- To write a balanced equation for the reaction of a metal in an aqueous acid.
- To write a balanced equation for the reaction of an active metal in water.

7.9 Solubility Rules

- To predict whether an ionic compound dissolves in water given the general rules for solubility.

7.10 Double-Replacement Reactions

- To write a balanced equation for the reaction of two salts in an aqueous solution.

7.11 Neutralization Reactions

- To write a balanced equation for the reaction of an acid and a base.

CHAPTER 8 The Mole Concept

8.1 Avogadro's Number

- To state the value of Avogadro's number: 6.02 x 1023.
- To state the mass of Avogadro's number of atoms for any element by referring to the periodic table.

8.2 Mole Calculations I

- To relate the moles of a substance to the number of particles.

8.3 Molar Mass

- To calculate the molar mass of a substance given its chemical formula.

8.4 Mole Calculations II

- To relate the mass of a substance to the number of particles.

8.5 Molar Volume

- To state the value for the molar volume of any gas at STP: 22.4 L/mol.

- To relate the density of a gas at STP to its molar mass and volume.

8.6 Mole Calculations III

- To relate the volume of a gas at STP to its mass and number of particles.

8.7 Percent Composition

- To calculate the percent composition of a compound given its chemical formula.

8.8 Empirical Formula

- To calculate the empirical formula of a compound given its mass composition.
- To calculate the empirical formula of a compound given its percent composition.

8.9 Molecular Formula

- To calculate the molecular formula of a compound given its empirical formula and molar mass.

CHAPTER 10 Gases

10.1 Properties of Gases

- To list five observed properties of a gas.

10.2 Atmospheric Pressure

- To state standard atmospheric pressure in the following units: atm, mm Hg, torr, cm Hg, in. Hg, psi, and kPa.
- To convert a given gas pressure to a different unit of measurement.

10.3 Variables Affecting Gas Pressure

- To identify the three variables that affect the pressure of a gas.
- To state whether gas pressure increases or decreases for a given change in volume, temperature, or number of moles of gas.

10.4 Boyle's Law: Pressure–Volume Relationships

- To sketch a graph of the pressure–volume relationship for a gas.
- To calculate the pressure or volume of a gas after a change in conditions.

10.5 Charles' Law: Volume–Temperature Relationships

- To sketch a graph of the volume–temperature relationship for a gas.
- To calculate the volume or temperature of a gas after a change in conditions.

10.6 Gay–Lussac's Law: Pressure–Temperature Relationships

- To sketch a graph of the pressure–temperature relationship for a gas.
- To calculate the pressure ortemperature of a gas after a change in conditions.

10.7 Combined Gas Law

- To calculate the pressure, volume, or temperature of a gas after a change in conditions.

10.8 The Vapor Pressure Concept

- To explain the concept of vapor pressure.
- To state the relationship between vapor pressure and temperature.

10.9 Dalton's Law of Partial Pressures

- To apply Dalton's law of partial pressures to a mixture of gases.

10.10 Ideal Gas Behavior

- To list five characteristics of an ideal gas according to the kinetic theory.

- To determine the value of absolute zero from a graph of volume or pressure versus temperature.

10.11 Ideal Gas Law

- To calculate the pressure, volume, temperature, or moles of gas from the ideal gas equation.

CHAPTER 11 Liquids and Solids

11.1 Properties of Liquids

- To identify five observed properties of a liquid.

11.2 The Intermolecular Bond Concept

- To explain the concept of an intermolecular bond.
- To describe three types of attraction between molecules in a liquid.

11.3 Vapor Pressure, Boiling Point, Viscosity, and Surface Tension

- To understand the concepts of vapor pressure, boiling point, viscosity, and surface tension.
- To relate the vapor pressure, boiling point, viscosity, and surface tension of a liquid to the strength of attraction between molecules.

11.4 Properties of Solids

- To identify five observed properties of a solid.

11.5 Crystalline Solids

- To describe three types of crystalline solids: ionic, molecular, and metallic.

11.6 Changes of Physical State

- To understand the concepts of specific heat, heat of fusion, and heat of vaporization.
- To calculate heat changes that involve specific heat, heat of fusion, and heat of vaporization.

11.7 Structure of Water

- To illustrate the bond angle and net dipole in a water molecule.

11.8 Physical Properties of Water

- To explain the unusual physical properties of water.

11.9 Chemical Properties of Water

- To write chemical equations for the chemical reactions of water.

11.10 Hydrates

- To calculate the percentage of water in a hydrate.
- To determine the water of hydration for a hydrate.

CHAPTER 12 Chemical Bonding

12.1 The Chemical Bond Concept

- To explain how valence electrons create a chemical bond.
- To predict whether a bond is ionic or covalent.

12.2 Ionic Bonds

- To describe the formation of an ionic bond between a metal atom and a nonmetal atom.

12.3 Covalent Bonds

- To describe the formation of a covalent bond between two nonmetal atoms by sharing valence electrons.

12.4 Electron Dot Formulas of Molecules
- To draw the electron dot formula for a molecule.
- To draw the structural formula for a molecule.

12.5 Electron Dot Formulas of Polyatomic Ions
- To draw the electron dot formula for a polyatomic ion.
- To draw the structural formula for a polyatomic ion.

12.6 Polar Covalent Bonds
- To state the electronegativity trends in the periodic table.
- To calculate the electronegativity difference in a polar covalent bond.
- To apply delta notation (d+ and d–) to a polar bond.

12.7 Nonpolar Covalent Bonds
- To describe and identify a nonpolar covalent bond.
- To identify seven elements that occur naturally as diatomic molecules: H2, N2, O2, F2, Cl2, Br2, I2.

12.8 Coordinate Covalent Bonds
- To describe and identify a coordinate covalent bond.

12.9 Hydrogen Bonds
- To describe hydrogen bond attraction between two molecules.

12.10 Shapes of Molecules
- To determine the shape of a molecule by applying VSEPR theory.
- To explain how a molecule with polar bonds can be nonpolar.

CHAPTER 13 Solutions

13.1 Gases in Solution
- To state the effect of temperature on the solubility of a gas in a liquid.
- To state the effect of pressure on the solubility of a gas in a liquid.

13.2 Liquids in Solution
- To apply the like dissolves like rule to predict whether a liquid is soluble or insoluble in another liquid.

13.3 Solids in Solution
- To apply the like dissolves like rule to predict whether a solid is soluble or insoluble in a liquid.

13.4 The Dissolving Process
- To illustrate how an ionic compound and a molecular compound dissolve in water.

13.5 Rate of Dissolving
- To state the effect of temperature, stirring, and particle size on the rate at which a solid compound dissolves in water.

13.6 Solubility and Temperature
- To interpret a graph that shows temperature versus solubility of a solid compound in water.

13.7 Unsaturated, Saturated, and Supersaturated Solutions

- To understand the distinction among solutions that are saturated, unsaturated, and supersaturated.
- To interpret a graph of temperature versus solubility and determine whether a solution is saturated, unsaturated, or supersaturated.

13.8 Mass/Mass Percent Concentration

- To calculate the mass percent concentration of a solution.
- To write three pairs of unit factors given the mass percent concentration of a solution.
- To perform calculations that involve a mass of solute, mass of solvent, and the mass percent concentration of a solution.

13.9 Molar Concentration

- To calculate the molar concentration of a solution.
- To write a pair of unit factors given the molar concentration of a solution.
- To perform calculations that involve a mass of solute, volume of solution, and the molar concentration of a solution.

13.10 Dilution of a Solution

- To perform calculations that involve a solution undergoing dilution.

13.11 Solution Stoichiometry

- To perform calculations that involve a balanced chemical equation and the molar concentration of a solution.

CHAPTER 14 Acids and Bases

14.1 Properties of Acids and Bases

- To list the general properties of acids and bases.
- To classify a solution of given pH as one of the following: strongly acidic, weakly acidic, neutral, weakly basic, or strongly basic.

14.2 Arrhenius Acids and Bases

- To identify an Arrhenius acid and base.
- To classify a strong or weak acid and base given the degree of ionization.
- To indicate the acid and base that react to produce a given salt.

14.3 Brønsted–Lowry Acids and Bases

- To identify a Brønsted–Lowry acid and base in a neutralization reaction.

14.4 Acid–Base Indicators

- To state the color of a solution with a given pH and a drop of phenolphthalein, methyl red, or bromothymol blue indicator.

14.5 Acid–Base Titrations

- To perform calculations given acid–base titration data.
- To express the molarity of a solution as a mass percent concentration.

14.6 Acid–Base Standardization

- To understand the concept of a standard acid or base solution.
- To perform calculations that involve standardization of an acid or base.

14.7 Ionization of Water

- To relate the ionization constant of water to the molar hydrogen ion and hydroxide ion concentrations.

- To calculate the molar hydroxide ion concentration given the molar hydrogen ion concentration.

14.8 The pH Concept

- To relate pH and molar hydrogen ion concentration.

14.9 Advanced pH Calculations

- To calculate pH values and molar hydrogen ion concentrations.

14.10 Strong and Weak Electrolytes

- To state the electrical conductivity of strong and weak electrolytes.
- To portray strong and weak electrolytes as ionized or nonionized.

14.11 Net Ionic Equations

- To state the procedure for writing a net ionic equation.
- To write net ionic equations for given chemical reactions.

CHAPTER 16 Chemical Equilibrium

16.1 Collision Theory

- To state the effect of collision frequency, collision energy, and orientation of molecules on the rate of a chemical reaction.
- To state the effect of concentration, temperature, and a catalyst on the rate of a chemical reaction.

16.2 Energy Profiles of Chemical Reactions

- To sketch the general energy profile for an endothermic and an exothermic reaction.
- To label the transition state, energy of activation, and heat of reaction on a given energy profile.

16.3 The Chemical Equilibrium Concept

- To describe the equilibrium concept for a reversible reaction.
- To express the law of chemical equilibrium as an equation.

16.4 General Equilibrium Constant, Keq

- To write the equilibrium constant expression for a reversible reaction.
- To calculate an equilibrium constant, Keq, from experimental data.

16.5 Equilibria Shifts for Gases

- To apply Le Chatelier's principle to reversible reactions in the gaseous state.

16.6 Ionization Equilibrium Constant, Ki

- To write the equilibrium constant expression for a weak acid or a weak base.
- To calculate an ionization constant, Ki, from experimental data.

16.7 Equilibria Shifts for Weak Acids and Bases

- To apply Le Chatelier's principle to solutions of weak acids and weak bases.

16.8 Solubility Product Equilibrium Constant, Ksp

- To write the equilibrium constant expression for a slightly soluble ionic compound.
- To calculate a solubility product constant, Ksp, from experimental data.

16.9 Equilibria Shifts for Slightly Soluble Compounds

- To apply Le Chatelier's principle to a saturated solution of a slightly soluble ionic compound.

CHAPTER 17 Oxidation and Reduction

17.1 Oxidation Numbers

- To explain the concept of an oxidation number.
- To assign an oxidation number for an element in each of the following:
  - (a) metals and nonmetals
  - (b) monoatomic and polyatomic ions
  - (c) ionic and molecular compounds

17.2 Oxidation–Reduction Reactions

- To identify the oxidized and reduced substances in a given redox reaction.
- To identify the oxidizing and reducing agents in a given redox reaction.

17.3 Balancing Redox Equations: Oxidation Number Method

- To write a balanced chemical equation for a redox reaction using the oxidation number method.

17.4 Balancing Redox Equations: Half-Reaction Method

- To understand the concept of a half-reaction.
- To write a balanced chemical equation for a redox reaction using the half-reaction method:
  - (a) in an acidic solution
  - (b) in a basic solution.

17.5 Predicting Spontaneous Redox Reactions

- To predict the stronger oxidizing agent and reducing agent given a list of reduction potentials.
- To predict whether a redox reaction is spontaneous or nonspontaneous given a list of reduction potentials.

17.6 Voltaic Cells

- To indicate the anode and cathode in a given voltaic cell.
- To indicate the oxidation and reduction half-reactions in a given spontaneous electrochemical cell.

17.7 Electrolytic Cells

- To indicate the anode and cathode in a given electrolytic cell.
- To indicate the oxidation and reduction half-reactions in a given nonspontaneous electrochemical cell.

INTEGRATION OF SCANS COMPETENCIES:

1. * Indicates Course Goal, Objective, or Activity designed to achieve SCANS Competencies.

2. All Specific Objectives listed for each chapter of the textbook contribute to achieving the SCANS Competencies.

3. All Assignments, TPOs, and Specific Objectives listed in the Campus Lab section of the Syllabus contribute to achieving the SCANS Competencies.

INTEGRATION OF SCANS COMPETENCIES
WITH COURSE GOALS, OBJECTIVES, AND ACTIVITIES

COURSE NUMBER MLAB 1291
COURSE NAME Special Topics in MLT – Chemistry section

SCANS COMPETENCIES AND FOUNDATION SKILLS	COURSE GOALS, OBJECTIVES, AND ACTIVITIES
RESOURCES	
ALLOCATES TIME	Performs routine chemistry tests Follows campus lab work schedule Completes labs within time allotted
ALLOCATES MONEY	
ALLOCATES MATERIAL AND FACILITY RESOURCES	
ALLOCATES HUMAN RESOURCES	
INFORMATION	
ACQUIRES & EVALUATES INFORMATION	
ORGANIZES & MAINTAINS INFORMATION	Completes campus lab report form so that another person could take over and finish task
INTERPRETS & COMMUNICATES INFORMATION	
USES COMPUTERS TO PROCESS INFORMATION	Uses simulated labs software Studies case histories Studies review questions
INTERPERSONAL	
PARTICIPATES AS A MEMBER OF A TEAM	Participates in class activities Develops a quality control program for campus lab
TEACHES OTHERS	Makes oral report on an assigned topic
SERVES CLIENTS/CUSTOMERS	Demonstrates understanding of role of introductory chemistry in the clinical laboratory
EXERCISES LEADERSHIP	
NEGOTIATES TO ARRIVE AT DECISION	Demonstrates interpersonal communication skills
WORKS WITH CULTURAL DIVERSITY	Demonstrates interpersonal communication skills with fellow students and instructor
SYSTEMS	
UNDERSTANDS SYSTEMS	Explains safety rules and regulations

MONITORS & CORRECTS PERFORMANCE	Follow directions for performing procedures Participates in a quality control program for campus lab Follows safety rules and regulations
IMPROVES & DESIGNS SYSTEMS	Develops a quality control program for campus lab
TECHNOLOGY	
SELECTS TECHNOLOGY	
APPLIES TECHNOLOGY TO TASK	
MAINTAINS & TROUBLESHOOTS TECHNOLOGY	
BASIC SKILLS	
READING	Follows directions to perform tests Completes reading assignments
WRITING	Summarizes oral report Completes laboratory report form in a manner that another person could finish the task
ARITHMETIC	
MATHEMATICS	
LISTENING	Follows directions Takes quiz after hearing oral reports Demonstrates interpersonal communication skills
SPEAKING	Gives oral report on assigned topic Demonstrates interpersonal communication skills
THINKING SKILLS	
CREATIVE THINKING	Gives oral report on assigned topic
DECISION MAKING	
PROBLEM SOLVING	Uses problem solving approach to distinguish situations that necessitate independent action from those that require referral to the instructor Uses flow charts to determine which tests to perform
SEEING THINGS IN THE MIND'S EYE	
KNOWING HOW TO LEARN	Completes assignments Participates in class and campus lab activities

PERSONAL QUALITIES	
RESPONSIBILITY	Attends class regularly Arrives for class on time Completes assignments Completes his/her own work
SELF-ESTEEM	Demonstrates interpersonal communication skills Completes assignments
SOCIABILITY	Demonstrates interpersonal communication skills Participates in class projects
SELF-MANAGEMENT	Attends class regularly Arrives for class on time Completes assignments Follows directions
INTEGRITY/HONESTY	Completes his/her own work Reports results exactly as determined

COURSE OBJECTIVES:

The following affective objectives pertain to both the classroom and clinical components:

1. Display professionalism by:
    a. demonstrating integrity, empathy, self-motivation, appearance/personal hygiene, time-management, respect and patient advocacy
    b. complying with the program dress code
2. Exhibit enthusiasm and interest in the profession of medical laboratory technology by asking questions, participating in class discussions and meeting with professors during office hours as needed.
3. Demonstrate progression in laboratory skills by effective organization, coordination of multiple tasks and insightful evaluation of results obtained.

Assignments: Check the class schedule for the topic to be covered at each class meeting and study the related material listed.

1. Read each chapter as assigned.
2. Study the specific objectives.
3. Learn definitions for Key Terms listed in each chapter.
4. Perform laboratory procedures as assigned.

TEXTBOOKS:

(Required):
1. Corwin, C. Introductory Chemistry: Concepts and Critical Thinking, 7th Ed., Pearson, 2014, ISBN 9780321804907.

COURSE OUTLINE:

CHAPTER 1 - Introduction to Chemistry
CHAPTER 3 - Matter and Energy
CHAPTER 4 - Models of the Atom
CHAPTER 5 - The Periodic Table
CHAPTER 6 - Language of Chemistry
CHAPTER 7 - Chemical Reactions
CHAPTER 8 - The Mole Concept
CHAPTER 10 - Gases
CHAPTER 11 - Liquids and Solids
CHAPTER 12 - Chemical Bonding
CHAPTER 13 - Solutions
CHAPTER 14 - Acids and Bases
CHAPTER 16 - Chemical Equilibrium
CHAPTER 17 - Oxidation and Reduction

METHODS OF EVALUATION:

Evaluation will be by written quizzes, examinations and additional assignments given by the instructor. In addition, there will be a final examination over all material covered during the semester. A cumulative average of 70% on the unit exams is required.

GRADING:
All grades will be posted in the Canvas gradebook. It is the student's responsibility to monitor the gradebook for the addition of updated grades.

Category	*Number*	*Each Worth (pts)*	*Total*
Exams	7	100	700
Assignments	10	30	300
			Total Points = 1000

Numerical grade values will be equivalent to the following scale:

A = 899.5-1000
B = 799.5-899.4
C = 699.5-799.4
D = 599.5-699.4
F = 599.4 or below

Please see the section "Instructor Policies" for the policies on Late Work, Quizzes & Tests, Assignments, etc.

METHODS OF INSTRUCTION:

Lecture-discussion and campus lab sessions will be correlated so that five (1-4) hours per week will be utilized to best advantage.

Visual aids, and Computer Assisted Instruction, may be used to reinforce the presented material. Campus laboratory experience, demonstrations, textbooks, periodicals and individualized instruction will be utilized. The student may be required to do some independent research.

COURSE REQUIREMENTS:

In order to achieve a passing grade, the following requirements must be met.

1. A cumulative exam average and an overall course average of 70% or better.
2. Regular attendance for lecture and Campus Lab is required. Responsibility for work missed is placed upon the student. More than two (2) absences are considered to be excessive.
3. A grade of "C" or better is required for graduation.

INSTRUCTOR POLICIES:

Exams

Exams will consist of multiple choice questions in a cumulative format to be answered in Canvas format. All test questions will be taken from topics discussed in class or covered in the reading material. Exams are given only during a defined window of time and must be completed during that time. If you experience a computer problem while taking the exam and it is a college computer and internet, allowances will be made for a retake. No such allowance is available for non-college equipment and internet.

The exam will not be released until after all exams have been graded.

A minimum overall exam average and overall course average of 70 percent must be obtained for successful completion of the course.

Assignments

Assignments will be taken up during the semester for a grade and are to be handed in according to the instructions provided by the instructor. Accommodations outside these instructions must be arranged between the instructor and the student prior to the assignment's deadline. It is highly recommended that the homework be performed in order to best understand the material.

Additional assignments may be given throughout the semester to aid in further in understanding of the material.

Dress Code Adherence

Students are expected to adhere to the program dress code for all scheduled class days. Students not following the dress code, as determined by the instructor and program policy, will be dismissed from class for the day. This will apply to laboratory and all exam days as well. Extenuating circumstances will be considered and determined by the instructor.

Electronic Devices

Cell phones must be placed on vibrate for all lectures and exams. If a student must leave the room to answer a call, they should leave and return as quietly as possible with minimum distraction to instructor and

fellow students. If cell phone usage becomes excessive, further disciplinary action will be taken by the instructor.

Computers and tablets may be brought to class to type notes, access powerpoints and assist with the learning topics. They are to be used for this purpose only and the student may be removed from class if the policy is abused. Social networking websites may be accessed during class breaks.

Late Work

Late assignments will be accepted through the next Monday with a 25 percent deduction off the grade. Notify the instructor if an extenuating circumstance arises before the assignment is due so that other arrangements can be made. Notifying the instructor afterwards is unacceptable.

Study Strategies for Students

Each unit of instruction follows a set of learning objectives found within the syllabus. Students, who demonstrate a thorough knowledge of the learning objectives, should score well on exams.

I do not provide study guides but recommend the objectives be answered during test preparation, as they can serve a similar purpose. It is highly recommended that students attend all lecture sessions and participate to the fullest extent. It is generally accepted that you will be studying for this (or any MLT course) for one-half to twice the number of credit hours as the course. For example: MLAB1335 Immunology/Serology is a three-hour class and will need approximately four-and-a-half to six hours of study time per week.

Students should not wait until the night before an exam to study. Studies have shown that students who study a certain amount each day are more likely to be successful. It is recommended that students read lecture material before a lecture is given, define unknown terms and prepare questions to ask the instructor during the lecture. Immediately after a lecture, the student should reread the lecture material and answer learning objectives as if they were study questions.

Tutoring is available to all students for lectures and labs in a course. It is the student's responsibility to file a request for a tutor in the Testing Center, and an appropriate tutor will be located. It is imperative that students request tutoring as soon as the need develops. Do not wait until the last minute to begin needed work. Tutoring for lecture or lab will be scheduled outside of regular class meetings.

CLASS ATTENDANCE:

Academic success is closely associated with regular classroom attendance and course participation. All successful students, whether on campus or online, are expected to be highly self-motivated.

All students are required to participate in courses regularly and are obliged to participate in class activities and complete and submit assignments following their professors' instructions.

Responsibility for work missed because of illness or school business is placed upon the student. More than two (2) absences are considered to be excessive. In addition, students' eligibility to receive financial aid or live in a College dormitory can be affected by withdrawal from courses. When withdrawal occurs, any tuition refund would be made in accordance with state regulations

STUDENT CONDUCT:

Students are expected to maintain classroom decorum that includes respect for other students and the instructor, prompt and regular attendance and an attitude that seeks to take full advantage of the educational opportunity.

ACADEMIC INTEGRITY:

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, and the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable.

STUDENT RESPONSIBILITY:

You have already made the decision to go to college; now the follow-up decisions on whether to commit to doing the work could very well determine whether you end up working at a good paying job in a field you enjoy. Education involves a partnership that requires both students and instructors to do their parts. By entering into this partnership, you have a responsibility to show up for class, do the assignments and reading, be engaged and pay attention in class, follow directions, and put your best effort into it. You will get out of your experience here exactly what you put into it – nothing more and nothing less.

CAMPUS LAB TERMINAL PERFORMANCE OBJECTIVES:

Upon completion of the assignments and practice in Campus Lab the student should be able to:

1. Attend class every day. Time is so limited during this course that attendance is extremely important.

2. Demonstrate a willingness to prepare for the role of MLT by

    a. arriving for campus lab sessions at the assigned time
    b. observing safety rules and regulations
    c. keeping all class records current including checklists and progress reports
    d. cooperating with the instructor and fellow students to maintain the campus lab and equipment in good condition

3. Demonstrate the ability to perform laboratory tests by

a. following written and verbal instructions
b. demonstrating increasing dexterity in the performance of manual procedures
c. demonstrating progressive accuracy, precision and speed
d. obtaining results within the limits set for each test

4. Demonstrate knowledge of theoretical concepts involved in the tests performed in campus lab by

a. recognizing results which do not correlate and reporting them to the instructor
b. associating unusual test results with the condition or disease which might be indicated

TITLE IX:
GC policy prohibits discrimination on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex, sexual orientation, spousal affiliation and protected veterans status.

Furthermore, Title IX prohibits sex discrimination to include sexual misconduct: sexual violence (sexual assault, rape), sexual harassment and retaliation.

For more information on Title IX, please contact:

Dr. Regina Organ, Title IX Coordinator (903-463-8714)
Dr. Dava Washburn, Title IX Coordinator (903-463-8634)
Dr. Kim Williams, Title IX Deputy Coordinator- South Campus (903) 415-2506
Mr. Mike McBrayer, Title IX Deputy Coordinator (903) 463-8753
Ms. Marilyn Power, Title IX Deputy Coordinator (903) 463-8625

Website: http://www.grayson.edu/campus-life/campus-police/title-ix-policies.html

GC Police Department: (903) 463-8777- Main Campus) (903) 415-2501 - South Campus)
GC Counseling Center: (903) 463-8730
For Any On-campus Emergencies: 911

Grayson County College is not responsible for illness/injury that occurs during the normal course of classroom/lab/clinical experiences.

These descriptions and timelines are subject to change at the discretion of the Professor.

Grayson College campus-wide student policies may be found on our Current Student Page on our website:
http://grayson.edu/current-students/index.html

Revised By: *Alan Jackson*
Last Revision: *August 24, 2016*