Course Information

Chemistry with Lab

NR.110. 206 (4.0 Credits)

Description

This course introduces the core concepts of matter and energy, atomic structure, the periodic system, chemical bonding, nomenclature, stoichiometry, weight relationships, gases, solutions, chemical reactions, thermodynamics and equilibrium. The course includes a virtual laboratory component designed to enhance lecture topics. The course content provides the foundation of general chemistry necessary for students who are interested in applying to health profession programs.For textbook information:http://nursing.jhu.edu/academics/programs/prerequisites/prerequisite-textbooks

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Department: NR PP
College: School of Nursing

Course Learning Objectives

Course Learning Outcomes (CLOs):

CLO1 Interconvert amount of substance between moles, mass and molecular weight.

CLO2 Use conversion factors in calculations involving solids, liquids, gases, solutions, heat and energy.

CLO3 Calculate and express solution concentrations in various ways, such as mass percent, parts per million, mole fraction, molality, and molarity.

CLO4 Write balanced chemical equations and distinguish between different types of chemical reactions.

CLO5 Describe the major components of an atom, write symbols for isotopes and calculate the average masses of elements.

CLO6 Predict direction of change in reactions at equilibrium and measure reaction rates.

CLO7 Predict the types of intermolecular forces within a compound.

CLO8 Describe the geometry and polarity of molecules and predict their physical properties.

CLO9 Describe the properties of acids and bases and measure their concentrations in solutions.

CLO10 Understand and explain the basic structure of hydrocarbons and the types of hydrocarbons.

Required Text and Other Materials

Required Textbooks and Course Materials:

Guinn, D. (2019). *Essentials of General, Organic, and Biochemistry: An integrated approach* (3rd ed.). New York, NY: WH Freeman and Company.
Labster: Students must purchase access to Labster in order to access the lab component of this course. More details on how to purchase can be found in the Syllabus & Course Info area of the classroom
Sapling: Students must purchase access to Macmillan's Sapling platform in order to access homework and quiz content. More details on how to purchase can be found in the Syllabus & Course Info area of the classroom
Access to a reliable computer and internet connection: It is recommended that students using Windows- based computers should have the Windows 7 or newer operating system, and that Mac users have OS 10.6 or later. We also recommend that you use the most updated version of Google Chrome as your web browser for this course. Other operating systems and web browsers may not be fully supported by the Canvas and Labster software. Please see the Canvas course site and the Labster website for detailed system requirements.

Summary of Learning Assessments/Assignments

Assessment Summary:

LEARNING ASSESSMENT/ ASSIGNMENT	COURSE OBJECTIVES ADDRESSED	WEIGHT TOWARD FINAL COURSE GRADE	DUE DATE
Module Graded Quizzes, 10 quizzes in total	1, 2, 3, 4, 5, 6, 7, 8, 9	20%	Dates vary See Course Schedule

LEARNING ASSESSMENT/ ASSIGNMENT	COURSE OBJECTIVES ADDRESSED	WEIGHT TOWARD FINAL COURSE GRADE	DUE DATE
Module Homework Assignments, 10 assignments in total	1, 2, 3, 4, 5, 6, 7, 8, 9	20%	Dates vary See Course Schedule
Completion of Lab Sessions and Lab Assignments & Reports, 10 lab sessions in total	1, 2, 3, 4, 5, 6, 7, 8, 9	30%	Dates vary See Course Schedule
Midterm Exam	1, 2, 3, 4, 5, 6, 7, 8, 9	15%	Module 5
Final Exam	1, 2, 3, 4, 5, 6, 7, 8, 9	15%	Module 10

Learning Assessments/Assignments

Learning Assessments/Assignments:

Homework Assignments

Weekly homework assignments are provided online via Sapling. There are 10 homework assignments in this course. Three attempts are allowed for each question or each group of questions. You will find the assignments under the â€œAssessmentâ€ section of each module.

Graded Module Quizzes

These quizzes are designed to test your mastery of the material covered in each module and keep you on track in your reading. They are not timed. The quizzes are open book and open notes. One attempt is allowed for each quiz. There are 10 graded quizzes in total in this course. You will find these quizzes under the â€œAssessmentâ€ section of each module.

Lab Sessions

Laboratory sessions will be completed via the Labster platform, which is linked to the Canvas Classroom. You are required to complete the related lab assignments for each lab. There are ten labs in total. The maximum point possible for each lab session is 100 points. If you miss a lab session, you will receive 0 for the lab

component of that module. There are no makeup labs. An average of 60% must be achieved in the lab component of the course in order for you to pass the course. Links to lab activities and related lab assignments are provided under the â€œLabâ€ section of each module in Canvas.

Exams
Comprehensive exams consisting of multiple choice and short answer questions will be given to assess student understanding of course content. They are open book, open notes and timed. Only one attempt is allowed for each exam. There are no makeup exams.

Supplemental Material
Throughout the course, you will find Practice Questions under the â€œOptional Learning Activitiesâ€ section in each module. In addition, eTextbook is also available if you prefer to read the textbook online. These activities provide self-assessment of the information presented in the lectures and the textbook and are not graded or counted towards your final course grade.

Evaluation and Grading

Grading Scale:

RANGE	LETTER GRADE	GRADE POINT
97-100	A+	4.0
93-96	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3
73-76	C	2.0

70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
<60	F	0

Course Schedule

Course Schedule:

Module	**Module Subtopics**	**Learning Activities & Resources**	**Learning Assignments/ Assessments**
Welcome Start Here		Familiarize yourself with Canvas and Labster Labs	Discussion Board: Introduce Yourself Avoiding Plagiarism Module
Module 1: Matter, Energy and Measurement	· Matter and Energy · Measurement in Science and Medicine · Significant Figures and Measurement · Using Dimensional Analysis	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). **Chapter 1**: Matter, Energy and Measurement Review the lecture materials posted in the module for this week.	Module 1 Homework Module 1 Quiz Module 1 Lab Assignment

Module	Module Subtopics	Learning Activities & Resources	Learning Assignments/ Assessments
Module 2: Atomic Structure and Radioisotopes	· Elements and the Structure of the Atom · Navigating the Periodic Table of the Elements · Electron arrangement and Valence Electrons · Radioisotopes: alpha and beta decay · High Energy Electromagnetic Radiation Penetrating power and Biological Effects of Radiation	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). **Chapter 2:** Atomic Structure and Radioisotopes Review the lecture materials posted in the module for this week.	Module 2 Homework Module 2 Quiz Module 2 Lab Assignment
Module 3: Ionic and Covalent compounds	· Ionic Compounds Containing Monoatomic Ions · Ionic Compounds Containing Polyatomic Ions · Covalent Compounds · Writing Lewis Dot Structures of Covalent Compounds	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). **Chapter 3**: Ionic and covalent compounds Review the lecture materials posted in the module for this week.	Module 3 Homework Module 3 Quiz Module 3 Lab Assignment

Module	Module Subtopics	Learning Activities & Resources	Learning Assignments/ Assessments
Module 4: Molecular Geometry and Polarity	· Three-Dimensional Shapes of Molecules · Bond Dipoles and Molecular Polarity · Intermolecular Forces of Attraction in a Compound	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). Chapter 4: Molecular Geometry and Polarity Review the lecture materials posted in the module for this week.	Module 4 Homework Module 4 Quiz Module 4 Lab Assignment
Module 5: Chemical Quantities	· Counting and Weighing Matter: The Mole · Writing and Balancing Chemical Equations · Types of Chemical Reactions	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). Chapter 5: Chemical Quantities Review the lecture materials posted in the module for this week.	Module 5 Homework Module 5 Quiz Module 5 Lab Assignment
Exam 1		Review content in Module 1 through Module 5	

Module	Module Subtopics	Learning Activities & Resources	Learning Assignments/ Assessments
Module 6: Chemical Reactions	· Energy and Chemical Reactions â€‹ · Rates of Chemical Reactionsâ€‹ · Chemical Equilibriumâ€‹	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). Chapter 6: Chemical Reactions Review the lecture materials posted in the module for this week.	Module 6 Homework Module 6 Quiz Module 6 Lab Assignment
Module 7: Changes of State and Gas Laws	· Changes of State · Properties of Gases and the Gas Lawsâ€‹ · Gas Mixtures and Partial Pressuresâ€‹	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). Chapter 7: Changes of State and Gas Laws Review the lecture materials posted in the module for this week.	Module 7 Homework Module 7 Quiz Module 7 Lab Assignment

Module	Module Subtopics	Learning Activities & Resources	Learning Assignments/ Assessments
Module 8: Mixtures, Solution concentrations, Osmosis and Dialysis	· Types of Mixturesâ€‹ · Solutions: Dissolving Covalent and Ionic Compounds in a Solvent · Solution Concentrationâ€‹ · Solution Dosage Calculations in Medicineâ€‹ · Solution Dilution Calculationsâ€‹ Osmosis and Dialysisâ€‹	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). Chapter 8: Mixtures, Solution concentrations, Osmosis and Dialysis Review the lecture materials posted in the module for this week.	Module 8 Homework Module 8 Quiz Module 8 Lab Assignment
Module 9: Acids and Bases	· Acids and Basesâ€‹ · pHâ€‹ · Acid-Base Neutralization Reactions · Buffersâ€‹	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). Chapter 9: Acids and Bases Review the lecture materials posted in the module for this week.	Module 9 Homework Module 9 Quiz Module 9 Lab Assignment

Module	Module Subtopics	Learning Activities & Resources	Learning Assignments/ Assessments
Module 10: Introduction to Organic Chemistry	· Introduction to Organic Chemistry and Hydrocarbonsâ€‹ · Alkanes and Cycloalkanesâ€‹ · Writing Condensed and Skeletal Line Structures of Alkanes and Cycloalkanesâ€‹ · Alkenes and Alkynes · Aromatic Hydrocarbons Â· Naming Substituted Hydrocarbonsâ€‹	Guinn, D. (2019). Essentials of General, Organic, and Biochemistry: An integrated approach (3rd ed.). Chapter 10: Introduction to Organic Chemistry Review the lecture materials posted in the module for this week.	Module 10 Homework Module 10 Quiz Module 10 Lab Assignment
Final Exam		Review content in Module 1 through Module 10	