CHM1020
CHEMISTRY FOR THE LIBERAL ARTS

FALL 2025; CLASS NUMBERS: 10843, 10845, 10846

INSTRUCTOR INFORMATION

Instructor

Dr. Martina Sumner

Associate Instructional Professor

I value your input regarding making this course more accessible and inclusive. Please reach out with suggestions.

Email/Office/Phone

Email in Canvas preferred

m.sumner@chem.ufl.edu

352-392-0517

Leigh Hall 404

Student hours

Via zoom: Tuesdays 2 to 3:40 PM (by appointment)

E-mail me via canvas and set up an appointment.

TEACHING ASSISTANTS

Grad TAs: TBA

Academic Resources offers free virtual tutoring assistance. See their website for details.

COURSE DELIVERY/MEETING TIMES

The course is 100% online/asynchronous. Students read through the text material and watch recorded lecture videos such that they keep up with the posted course schedule. Student hours are scheduled regularly, during which time students may attend to ask course-related questions. Outside of student hour times, students can post questions to the course Discussion Boards or use Canvas email.

COURSE FEES

Additional Course Fees: 10843 ($27.99), 10845 (none), 10846. Fees are distance learning fees, which support course production, IT support costs, and proctoring fees.

AUDIO/VIDEO POLICY

As in all courses, unauthorized recording and unauthorized sharing of recorded materials are prohibited.

GENERAL INFORMATION

PREREQUISITES

High school algebra.

COURSE DESCRIPTION

This course provides students with an introduction to chemical principles and applications for the non-science major. Students will engage in problem solving and critical thinking while applying chemical concepts. Topics

will include the scientific method of problem solving, classification of matter, atomic theory, the periodic table, gases, chemical reactions, energy, and chemical bonds. (P)

GENERAL EDUCATION OBJECTIVES AND LEARNING OUTCOMES

General Education Designation: Physical Sciences (P) (area objectives available here):
Natural Science courses afford students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena. **Physical Science (P)** is a sub-designation of Natural Science courses at the University of Florida. These courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

A minimum grade of C is required for general education credit. Courses intended to satisfy the general education requirement cannot be taken S/U.

Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate the outcomes of experiments.

Student Learning Outcomes:

1. Students will be able to distinguish between physical and chemical properties and changes.
2. Students will recognize components of gaseous chemistry.
3. Students will recognize components of aqueous chemistry including properties of water, solutions, and acids and bases.
4. Students will correlate the design of the periodic table to periodic trends and physical and chemical properties of elements
5. Students will write and interpret chemical formulae and write balanced chemical equations.

The course objectives align with the UF General Education student learning outcomes and physical science area learning outcomes:

General Education SLO	Physical Science SLO	Course Objective Alignment	Assessment
Content	Identify, describe, and explain the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant	Objectives 1-5	All assessments and student practice assignments offer opportunities for students to demonstrate content knowledge.

	processes that govern biological and physical systems.		
Critical Thinking	Formulate empirically-testable hypotheses derived from the study of physical processes or living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve scientific problems and to evaluate outcomes.	Objectives 1-5	Discussions, Essay, Presentations, Infographics, Quizzes, and Assignments based on interactive simulations.
Communication	Communicate scientific knowledge, thoughts, and reasoning clearly and effectively.	Objectives 1-5	Discussions, Essay and Biography, Infographics, Videos, Presentations, assignments based on interacting with online simulations, and peer reviews.

COURSE LEARNING OUTCOMES

A complete list of student learning outcomes is posted in Canvas, organized by module/chapter.

FIRST DAYS

Log into Canvas and access the course. You should check daily for new Announcements and/or emails containing important information and reminders. Click on the *Syllabus* tab to view all due dates for the entire semester. Click on *Modules* and read all the information under the *Settling In* section.

REQUIRED & RECOMMENDED COURSE MATERIALS

There is no formal textbook adoption for this course. Students are directed to relevant readings each week. Readings for each module are estimated to require no more than 1 h and generally consist of specific sections from OpenStax Chemistry.

CALCULATOR

You will require a scientific calculator capable of logarithmic functions.

COURSE COMMUNICATIONS

GENERAL QUESTIONS

General course questions should be posted to the Discussion: Course Q&A in Canvas. The instructor/TA response time is <48 h (typically <24 h) during the work week.

I encourage you to post questions related to homework or end of chapter questions you're working on to the Discussion board. The homework isn't meant to be a test, it's a learning tool. For the best response, take a screenshot of your question and/or the solution you propose. The more information you provide, the easier it is for your instructor/TA/another student to help.

PRIVATE OR GRADE-RELATED QUESTIONS

Direct these to your instructor via the mail function in Canvas. Do not email outside of Canvas to your instructor's external email address – we prefer not to discuss grade related questions outside of Canvas. You will please be asked to resend the query through Canvas.

COURSE POLICIES

AI POLICY

Students may use generative artificial intelligence (AI) tools—such as ChatGPT—as a **tutoring resource** to support their understanding of chemistry concepts. These tools can be helpful for reviewing content, asking clarifying questions, exploring alternative explanations, and practicing problems. However, all **submitted assignments and quizzes must reflect the student's own original work.** Generative AI must not be used to generate responses or solve problems that are submitted for a grade.

Because AI tools can produce content that is inaccurate, misleading, or inappropriate for scientific contexts, students are responsible for verifying the accuracy of any information provided by AI.

Use of AI in a way that violates these guidelines may constitute a violation of the University of Florida Honor Code. Expectations for AI use may differ across courses and instructors. Students should contact the instructor with any questions about appropriate use.

Adapted from Harvard University's AI Guidance: https://oue.fas.harvard.edu/ai-guidance

SYLLABUS QUIZZES/SURVEYS

A syllabus quiz and other introductory quizzes are delivered near the beginning of the course to ensure you have reviewed course policies and read the syllabus. Surveys are delivered mid-semester and near the end of term to gather feedback on course design and delivery.

You can submit these assignments late, with a 20% penalty per day submitted late. Make sure to open and submit the quizzes for all attempts prior to the due date to avoid the late penalty. Note that even 1 s past the due date counts as a whole day late.

Time required to complete each is estimated to be <10 min.

QUIZZES/DISCUSSIONS/ASSIGNMENTS

Sectional quizzes are delivered through Canvas. These quizzes are not proctored or timed and are subject to the Honor Code, and are generally designed to assess content knowledge, ability to interpret figures and graphs, and ability to perform discipline-specific calculations. Grade details are prominently posted in Canvas for each. Each can be submitted late, with a penalty of -20% per day submitted late. The quizzes are not timed, and each is estimated to require <15 min per attempt.

DISCUSSIONS

Lessons may involve discussion assignments in which you are asked to associate content with practical applications, such as calculation and analysis of water footprint, personal radiation dose, or to critically analyze an advertisement making scientific claims. Grading rubrics are prominently posted in Canvas for each. Discussions require timely, substantive comments on classmates' posts to foster a collaborative learning environment in this asynchronous course; students don't work synchronously on the lessons, but each does span a specified period. Each is estimated to require 10 - 25 min to complete.

PLAYPOSIT

Participation points are available by watching lecture videos and supplemental videos for the course. Students have varied backgrounds and may benefit from reviewing provided lecture material as well as curating supplemental videos of their own choosing. Watching the entire playlist for each lesson provides full credit for participation for that lesson. Each module may include videos totaling 2-3 h in total watch time, not all of which will be necessary for all students.

'NEW QUIZZES'

The New Quizzes Tool is used to deliver assignments that often involve student interaction with an online simulation or simulations to foster deeper understanding of abstract concepts such as molecular geometry and polarity, and the gas laws. They may also involve Literature Review, in which you will access a journal article using UF VPN and answer guided questions to practice critical thinking and analysis. These are not timed and are estimated to require 45 min to complete.

ASSIGNMENTS

Each module includes at least one Assignment. These take the form of presentations (Google Slides/PowerPoint presentations, with and without audio/video), an infographic, and a short essay comparing/contrasting how the scientific method is presented, and how accurately, in two movies, documentaries or novels of your choosing. Each assignment encourages you to relate the content coverage with real-world scenarios personal to you and allows a degree of creativity in production. Each of these allows you to communicate to your instructor and TAs your understanding and ability to apply concepts and to distil and analyze information you have curated. Each is estimated to require 2-3 h of research time and an additional 90 – 120 min to complete. Assignments are checked for plagiarism through Turnitin. Students perform peer review on each other's assignments.

ATTENDANCE, EXTENSION REQUESTS

All due dates for assignments are clearly posted in the course assignments of the Canvas page and reflect the most up-to-date information. The deadline for assignments is 11:59 p.m. on the day stated on the lecture schedule. All assignments/quizzes must be completed by the stated due date and time for credit. Extensions for assignments (exams are covered under the General Chemistry Exam Absence Policy) can be requested due to illness or emergent situations.

You may be asked to have provide an excuse note from the Dean of Students Office before such an extension is considered. Information on requesting an excuse note can be found here: https://care.dso.ufl.edu/instructor-notifications/

An excuse documenting illness or a personal matter must be provided for at least 50% of the days allocated for completion of the assignment (for example, if the duration of a Module is six days, documentation of illness

or a personal matter should be provided for at least three of those days) for accommodations to be considered. Extensions will NOT be given because of technical or personal issues that occur within 24 hours of the assignment deadline.

Requirements for class attendance and assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

GRADING

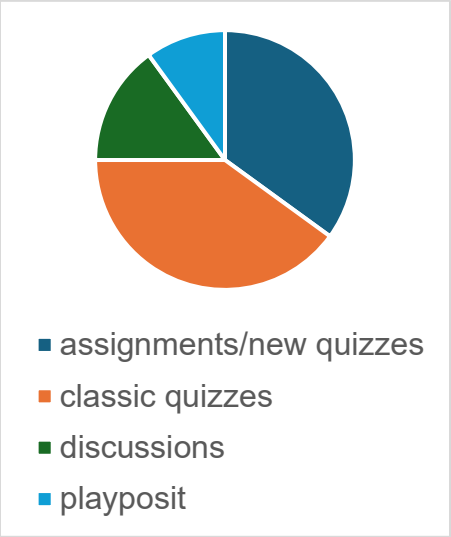
GRADE POLICY

A minimum grade of C is required for general education credit. Courses intended to satisfy the general education requirement cannot be taken S/U.

There is no extra credit available for this course. Grades are not rounded at the end of term. Exam grades or course grades are not curved. Lowest grades are dropped for all students as follows: Playposit Videos (lowest 3), Assignments (-2), Discussions (-2), Quizzes (-2).

Assignments weights are as follows:

Assignment Group	Weight %
Assignments and New Quizzes (lowest 2 scores dropped)	35%
Classic Quizzes (lowest 2 scores dropped)	40%
Discussions (lowest 2 scores dropped)	15%
Videos: Playposit (lowest 3 scores dropped)	10%



Grade scale (note: there is no rounding to your score in Canvas):

Letter	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Cutoff	90.0	87.0	84.0	81.0	78.0	75.0	72.0	69.0	66.0	63.0	60.0	< 60.0

UNIVERSITY POLICIES

STUDENTS REQUIRING ACCOMMODATIONS

Students who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

The student is responsible for scheduling the exam dates with the DRC. Students with disabilities should follow this procedure as early as possible. The DRC has 4 business day policy to submit Accommodated Testing Requests (ATRs). You must submit this documentation prior to submitting assignments or taking quizzes or exams. Accommodations are not retroactive; therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT

University of Florida students are bound by the Honor Pledge. On all work submitted for credit by a student, the following pledge is required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Student Honor Code and Conduct Code (Regulation 4.040) specifies a number of behaviors that are in violation of this code, as well as the process for reported allegations and sanctions that may be implemented. All potential violations of the code will be reported to Student Conduct and Conflict Resolution. If a student is found responsible for an Honor Code violation in this course, the instructor will enter a Grade Adjustment sanction which may be up to or including failure of the course. For additional information, see https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/.

CAMPUS RESOURCES

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

ACADEMIC RESOURCES

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: 1317 Turlington Hall, Call 352-392-2010, or to make a private appointment: 352- 392-6420. Email contact: teaching-center@ufl.edu. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Academic Complaints: Office of the Ombuds; Visit the Complaint Portal webpage for more information.

Enrollment Management Complaints: View the Student Complaint Procedure webpage for more information.

FEEDBACK

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

1. The email they receive from GatorEvals,

2. Their Canvas course menu under GatorEvals, or

3. The central portal at https://my-ufl.bluera.com/

Guidance on how to provide constructive feedback is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

NETIQUETTE

Please see the detailed Netiquette guide in the Settling In section of the Canvas course.

NETIQUETTE

Any classroom issues, disagreements or grade disputes should be discussed first between the instructor and the student. If the problem cannot be resolved, please contact Mrs. Melanie Veige, Director of General Chemistry, Director of the General Chemistry Laboratories (melveige@ufl.edu). Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (http://www.ombuds.ufl.edu; 352-392-1308) or the Dean of Students Office (http://www.dso.ufl.edu; 352-392-1261).

DISCLAIMER

Unforeseen circumstances including university closure (weather related, etc.) may necessitate a schedule adjustment. Any changes are communicated promptly to students.

SCHEDULE OF TOPICS

*The most up to date complete schedule is posted in Canvas. This document may have been updated since posting – check Canvas for details.

Each module may involve readings, videos (Playposit), discussions, assignments, quizzes, new quizzes and/or interactive simulation components. Page numbers for OpenStax readings refer to the .pdf version of OpenStax Chemistry 2e (downloaded 8/14/2024).

Course Orientation (Aug. 28)

Everyone introduces themselves in an 'Introduce Yourself' video and demonstrates familiarity with the course syllabus via the Course Orientation Quiz. Tools used in the course are introduced with instructions. Suggestions for constructive participation on discussion boards are presented. A Discussion Board for Q&A is available for any questions.

Discussion: Introduce Yourself

Quiz: Course Orientation Quiz

Module 1: Chemistry and the Scientific Method (August 28 – Sept. 9)

What is chemistry, and what do chemists do?

Lesson 1 Chemistry in Context Sept. 2

The historical development of chemistry, a discussion of the scientific method and its history.

Reading: Chemistry in Context

Exercise: Chemistry in Context

Lesson 2 Bad Science Sept. 3

How to look critically, with a scientist's eye, at advertisements presenting scientific data in tables or charts.

Reading: How to Spot Bad Science (blog post; est. reading time 14 min)

Discussion: Critically Evaluating Advertisements

Lesson 3 Scientific Method Sept. 5

A deep dive into the scientific method, the differences between scientific theory and law, and how the scientific method applies generally.

PlayPosit Playlist: The Scientific Method (max 32 min)

Discussion: Using the Scientific Method in the Real World

Lesson 4 Scientific Method in our Everyday Lives Sept. 9

An example of applying the scientific method to food and wine pairings. We will read a journal article and practice critical assessment of data presented in text, tables and graphs in the article. A video accompanies the article.

PlayPosit Video: Food and Wine Pairings (max 15 min)

Literature Review: The Scientific Method Quiz

Assignment: The Scientific Method in Popular Media

Module 2: Numbers (Sept 10-18)

How to express values both small and large using units, prefixes, standard and scientific notation. Introduction to accuracy and precision and significant figures. Importance of numbers in communicating to the public.

Lesson 1 Measurements Sept. 15

SI units, metric prefixes and use in calculations.

Readings: Openstax Chemistry 2e 1.4 (pp. 27-33), 1.5 (pp. 33-41), 1.6 (pp. 41-47), 1.3 (pp. 23-27)

Exercises: Openstax Chemistry 2e 1.4, 1.5, 1.6

Lesson 2 Numbers Sept. 18

Importance of significant figures in expressing measurements and carrying sig figs through in calculations. Accuracy and precision and the differences between them. Expressing big and small numbers using scientific notation.

PlayPosit Playlist: Numbers (max 36 min)

Quiz: Numbers

Discussion: Accuracy and Precision

Module 3: The Periodic Table (Sept. 19-26)

Organization and history of the periodic table. Introduction to subatomic particles and their discovery.

Lesson 1 The Periodic Table Sept. 24

History of atomic theory, design/development of the periodic table, using the periodic table to make inferences. Description of atom and the subatomic particles; writing isotope symbols.

Readings: LibreText Chemistry 2.3; Openstax Chemistry 2e 2.5 (pp. 84-89); Khan Academy 3.2; LibreText Chemistry 3.5

PlayPosit Playlist: Periodic Table (max 39 min)

Quiz: Atoms and the Periodic Table

Lesson 2 Biography of a Chemist Sept. 26

Research a chemist using library and web resources and create dynamic audiovisual presentation, peer reviews. Comment on relevance of historical work in everyday life.

Assignment: Biography of a Chemist

Module 4: Compounds (Sept. 26 – Oct. 9)

Formulas and names of ionic and molecular compounds, formation from their elements. Commonly encountered compounds: sugars, aspartame, table salt, baking powder and baking soda. Reading of ingredient labels.

Lesson 1 Ionic Compounds Oct. 3

Formation of ionic compounds, names and formulas. Writing formulas for cations and anions. Sharing vs transfer of electrons.

Readings: Openstax Chemistry 2e 2.6 (pp. 89-96); Libretext Chemistry 4.3; Openstax Chemistry 2e 2.7 (pp. 96-104)

PlayPosit Playlist: Ionic Compounds (max 17 min)

Lesson 2 Molecular Compounds Oct. 8

The octet rule, writing simple Lewis structures. Formation of covalent bonds, electronegativity and bond and molecular polarity.

Readings: LibreText Chemistry 4.4; Openstax Chemistry 2e 7.2 (pp. 317-322), 7.3 (pp. 322-332)

PlayPosit Playlist: Molecular Compounds (max 22 min)

Assignment: Building Simple Molecular Compounds

Quiz: Ionic and Molecular Compounds

Module 5: Earth (Oct. 9 -24)

Chemistry of fuels obtained from the earth. Coal mining in Kentucky and West Virginia, and in Africa (documentaries). Chemical and physical change, combustion, writing chemical equations to describe chemical reactions. Energy diagrams and catalysis.

Lesson 1 Chemical Safety Oct. 10

Reading labels on transport trucks (NFPA diamond). Importance of chemical safety in everyday life, and awareness of how we encounter safety symbols in the world.

Reading: Hazardous Materials Identification

PlayPosit Video: Recognizing Hazards (max 6 min)

Quiz: NFPA Diamond and Safety Vocabulary Words

Lesson 2 Chemical & Physical Properties Oct. 14

Chemical and physical properties and changes. Development of vocabulary to describe observations of matter encountered in everyday life.

Reading: Openstax Chemistry 2e 1.3 (pp. 23-27)

PlayPosit Video: Chemical and Physical Properties (max 4 min)

Quiz: Chemical and Physical Change

Lesson 3 Chemical Reactions Oct. 20

Deeper understanding of chemistry related to fossil fuel production and environmental implications. Energy diagrams and catalysis

Readings: Libretext 15.6, 15.7, 15.2; Openstax Chemistry 5.1 (pp. 212-221), 12.7 (pp. 635-642)

PlayPosit Playlists: Coal Mining in the United States (optional; max 180 min)**; The Fossil Fuel Industry** (optional; max 200 min)**; Endothermic and Exothermic Processes**

Assignment: Oil Infographic

Quiz: Energetics, Energy Diagrams and Catalysis

Lesson 4 Fuel and Combustion Oct. 24

Balancing chemical equations, combustion and Fuels.

Readings: LibreText Chemistry – Combustion Reactions; Openstax Chemistry 2e 4.1 (pp. 160-166); LibreText Chemistry 5.1

PlayPosit Playlist: Balancing Chemical Equations (max 30 min)

Discussion: Fuel Efficiency

Quiz: Balancing Equations, Combustion Reactions

Module 6: Air (Oct 24 – Nov. 4)

Application of chemical principles to scientific fields including climatology and atmospheric sciences. Analyzing weather reports, understanding barometric pressure, and exploring the chemistry of weather and climate.

Lesson 1 Air Quality Oct. 31

Layers of the atmosphere and their constituents (gases). Chemical formula and Lewis structures of small gas molecules. The EPA and AQI; discussion of pollutants.

Readings: LibreText Chemistry 13.1, 13.3, 13.4, 13.5, 13.10

Assignment: News Journal Presentation

Discussion: Air Quality Index

Quiz: Pollutants

Lesson 2 Gases Nov. 4

Gas behavior in terms of pressure, volume, amount and temperature; using the Kinetic Molecular Theory to describe behavior of gases.

Readings: Openstax Chemistry 2e Introduction, 9.1 (pp. 416-425), 9.2 (pp. 425-437), 9.5 (pp. 454-458)

Exercise: Gases

PlayPosit Playlist: Gases (max 25 min)

Assignment: Exploring the Gas Laws

Quiz: Gas Laws

Module 7: Fire (Nov. 5 - 12)

Current and recent events (Fukushima, etc.) and the related chemistry.

Lesson 1 Energy Nov. 7

Readings: energy of fuels and foods, quantification of energy (energy units). Alternative energy and energy storage. Production of electrical energy and how it is delivered to your home; meaning of kilowatt hour. Fossil fuels.

Readings: Openstax Chemistry 2e 5.1 (pp. 212-221)); LibreText Chemistry 15.2, 7.2, 7.3

PlayPosit Playlist: Internal Energy (max 35 min)

Assignment: Energy Generation Near Me

Quiz: Energy Units and Conversion

Lesson 2 Nuclear Nov. 14

Nuclear reactions are different from other chemical reactions in that they involve change in the nucleus of the atom such that the element's identity is changed. Balancing nuclear equations and describing different types of nuclear decay and the radioactive particles released. Nuclear power plants and safety.

Readings: LibreText Chemistry 7.4; Openstax Chemistry 2e 21.2 (pp. 1028-1031), 21.3 (pp. 1031-1042), 21.4 (pp. 1042-1055)

PlayPosit Playlist: Nuclear Reactions (max 22 min)

Discussion: Personal Radiation Dose

Quiz: Nuclear Equations

Module 8: Water (Nov. 12 - 18)

How does water in the ocean, rivers and streams wind up as drinking water? How do we quantify and identify pollutants in water and assess purity?

Lesson 1 Chemistry and Global Awareness Nov. 14

The water cycle, properties of water, inter- and intramolecular forces. Drinking water contamination (Flint, MI), sources of pollution, acid rain. Regulatory agencies, and water treatment (example: on the International Space Station). Water treatment, the Salton Sea.

Readings: LibreText Chemistry 8.1, 14.1, 14.3, 14.4, 8.3, 8.4, 14.6, 14.7, 8.6

Assignment: Drinking Water Near Me

Discussion: Water Footprint

Quiz: Water Properties, Treatment, and Contaminants

Lesson 2 Molarity and pH Nov. 17

Calculations of concentration, using formula mass and molar mass, dilution, and the pH scale.

Readings: Openstax Chemistry 2e 3.1 (pp. 118-129), 3.3 (pp. 136-144), 14.2 (pp. 697-702); LibreText Chemistry 7.6

PlayPosit Playlist: Solutions (max 70 min)

Quizzes: Molar Mass and Moles; Solutions, Concentrations, and pH

Module 9: Biochemistry (Nov. 19 – Dec. 3)

Lesson 1 Carbohydrates Nov.19

Carbohydrates are organic molecules consisting of carbon, oxygen and hydrogen. Energy storage as starch.

Reading : LibreText Chemistry 16.2

PlayPosit Playlist : Monosaccharides, Disaccharides, and Polysaccharides (max 14 min)

Quiz : Carbohydrates

Lesson 2 Fats Nov.21

Overview of fats/fatty acids and lipids, and their properties and functions; variation of melting point with structure. Saturated and unsaturated fatty acids, solubility, and interpreting tables and graphs.

Reading : LibreText Chemistry 16.3

PlayPosit Video : Lipids (max 7 min)

Quiz : Fats and Oils

Lesson 3 Proteins Dec. 1

Amino acids and their composition.

Reading : LibreText Chemistry 16.5

PlayPosit Playlist : Peptides and Proteins (max 20 min)

Quiz : Proteins

Lesson 4 Nucleic Acids Dec. 4

Nucleotides, nitrogenous bases. How genetic engineering works, why it is done, analysis of benefits vs risks.

Reading: LibreText Chemistry 16.6

Playposit Playlist: Nucleic Acids (max 41 min)

Assignment: Genetic Modification Presentation

Quiz: RNA/DNA

SAMPLE GRADING RUBRICS

AIR QUALITY INDEX (AQI) DISCUSSION RUBRIC

Criteria	Ratings			Points
Location	**1 pts** **Full Marks** The student indicates the location.	**0 pts** **No Marks** The student does not indicate their chosen location		1
AQI	**2 pts** **Full Marks** The student lists the AQI for all pollutants present at the location.	**0 pts** **No Marks** The student does not indicate AQI for all pollutants at the location.		2
Source	**2 pts** **Full Marks** The student proposes possible sources of the pollutants, specific for their particular location.	**1 pts** **Partial Marks** The student proposes possible sources but does not relate them to their chosen location.	**0 pts** **No Marks** The student does not propose possible sources of pollutants that relates to their location and/or AQI.	2
Health	**2 pts** **Full Marks** The student discusses health effects at measured levels for each pollutant mentioned for their location.	**1 pts** **Partial Marks** The student may discuss health effects but not at specific levels, or may omit one or more pollutants mentioned.	**0 pts** **No Marks** The post is insufficient.	2

Comments	**2 pts** **Full Marks** The student makes substantive comments on at least two classmates' posts.	**1 pts** **Partial Marks** The student makes substantive comments on one classmate's post.	**0 pts** **No Marks** The student does not make substantive comments.	2
Total				9

CRITICALLY EVALUATING ADVERTISEMENTS DISCUSSION

Criteria	Ratings			Points
Clinical results vs consumer perception	**2 pts** **Full Marks** The student describes what they perceive to be the differences between clinical results and consumer perception.	**1 pts** **Partial Marks** The student describes only one of the two.	**0 pts** **No Marks**	**2**
Sample size	**2 pts** **Full Marks** The student proposes sample size and reasoning.	**1 pts** **Partial Marks** The student proposes a valid sample size but doesn't clearly explain why they selected the value.	**0 pts** **No Marks**	**2**
Additional information	**3 pts** **Full Marks** The student clearly identifies at least three pieces of information they would like to see and explains why each is important.	**2 pts** **Partial Marks** The student may be missing one required piece of information or reasoning.	**0 pts** **No Marks** The student has omitted more than one required piece of information/reasoning.	**3**
Comments	**2 pts** **Full Marks** The student makes comments on at least two students' posts that provide insight and encourage further discussion.	**1 pts** **Partial Marks** The student makes comments on one classmate's post that provides insight and encourages further discussion OR makes two comments that are not substantial.	**0 pts** **No Marks** The student doesn't make comments or doesn't provide insightful comment.	**2**

Total	9

The Scientific Method in Popular Media

Criteria	Ratings				Points
Completeness	**10 pts** **Full Marks** The student fully describes two examples of the scientific method, identifying all required steps.	**6 pts** **Partial Marks** The student describes two examples of the scientific method but either does not describe the examples thoroughly enough or does not identify all required steps.	**3 pts** **Partial Marks** The student describes one example of the scientific method but either does not describe the examples thoroughly enough or does not identify all required steps.	**0 pts** **No Marks** The student describes their example(s) of the scientific method poorly.	10
Similarities and differences	**5 pts** **Full Marks** The student identifies at least two similarities and/or differences in the authors' approaches to using the scientific method.	**3 pts** **Partial Marks** The student identifies one similarity and/or difference in the authors' approaches to using the scientific method.	**2 pts** **Partial Marks** The student inadequately identifies one similarity and/or difference in the authors' approaches to using the scientific method.	**0 pts** **No Marks** The student does not identify any similarities and/or differences in the authors' approaches to using the scientific method.	5
Citations	**2 pts** **Full Marks** The student provides two citations for the sources used (movies, novels, audiobooks).	**1 pts** **Partial Marks** The student provides one citation for the source used.		**0 pts** **No Marks** No citations or inadequate citations are provided.	2
				Total	17

Oil Infographic

Criteria	Ratings			Points
Company Name and Location	**2 pts** **Full Marks**	**1 pts** **Partial Marks**	**0 pts** **No Marks**	2

	The name and location of the company are included.	Either the name or location is omitted or is not specific.		
Size	**1 pts** **Full Marks** The size of the company is specified.	**0 pts** **No Marks** The size of the company is missing or non specific.		1
Sourcing and Processing	**3 pts** **Full Marks** How and where the petroleum is sourced and processed is thoroughly described.	**1.5 pts** **Partial Marks** Either sourcing or processing is omitted or one is inadequately described.	**0 pts** **No Marks** Either both are inadequately described or are missing.	3
Chemistry	**3 pts** **Full Marks** The student describes the chemistry involved and provides a specific relevant chemical equation.	**1.5 pts** **Partial Marks** The description of the chemistry involved is insufficient.	**0 pts** **No Marks** Either the chemical equation is omitted or the chemistry description is minimal.	3
Value	**1 pts** **Full Marks** The value of the company is included.		**0 pts** **No Marks** The value is omitted.	1
Societal Impacts	**2 pts** **Full Marks** The student describes societal impacts of the company.	**1 pts** **Partial Marks** The description is inadequate.	**0 pts** **No Marks** Societal Impacts are not addressed.	2
Environmental Impacts	**2 pts** **Full Marks** The student describes environmental impacts of the company including a specific example.	**1 pts** **Partial Marks** The student inadequately describes the environmental impacts.	**0 pts** **No Marks** Either a specific example is not included or the description is woefully inadequate or missing.	2
Total				14