

CHM1020 CHEMISTRY FOR THE LIBERAL ARTS

SUMMER B 2024



INSTRUCTOR INFORMATION

Instructor	Email/Office/Phone	Preferred Contact
Stacey-Ann Benjamin sbenjami@ufl.edu	Email in Canvas only 352-294-3435 FLI 255	Email through Canvas messaging Zoom office hours (TBA)

TEACHING ASSISTANT

Grad TAs: TBA

Email: through Canvas email; Office hours (via Zoom): see Canvas for schedule

[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. Office hours are scheduled regularly during which time students may attend to ask course related questions. Outside of office hour times, students can post questions to the course Discussion Boards or use Canvas email.

COURSE FEES

Additional Course Fees: \$18.00

AUDIO/VIDEO PRESENCE POLICY

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

GENERAL INFORMATION

PREREQUISITES

High school algebra.

COURSE DESCRIPTION AND GOALS

CHM 1020 is a terminal chemistry course for non-science students that presents the basic concepts of chemistry and examines the role of chemistry in both consumer products and the environment. (P)

By the end of this course, students should be able to analyze media as it pertains to topics related to chemistry, including the ability to interpret tables of data and graphs of various forms. Students will be competent in using mathematics to solve problems in chemistry. Students will be able to understand basic concepts related to atomic and molecular structure, and relationships between heat and energy. Students will be able to apply these concepts to explain the molecular and physical basis for climate change, solution chemistry, and atmospheric chemistry.

Specifically, students will be able to:

1. Use the mole concept and perform related mathematical conversions to determine the quantity of substances. Calculate reactant and product quantities in chemical reactions through the formulation and use of balanced equations using stoichiometry.
2. Evaluate the organization of the periodic table and its predictive power for the properties of elements in various contexts, and extend to association of geometry, polarity and other properties of compounds with their structure and function in real-world applications.
3. Explain the behavior of gases using the gas laws and relate to atmospheric phenomena and the environment.
4. Apply concepts of nuclear chemistry including radioactive decay and half-life to fields such as medicine, energy production, and environmental issues including pollution.
5. Associate properties of acids and bases and the pH scale in real-world settings including foods and the environment.
6. Examine the structure and function of carbohydrates, proteins and lipids. Connect their chemical properties to biological functions and to practical applications such as nutrition and biotechnology.
7. Communicate effectively in written and oral forms to explain chemical concepts and their practical applications to a non-scientific audience.

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

GENERAL EDUCATION OBJECTIVES AND LEARNING OUTCOMES

Primary General Education Designation: Physical Sciences (P) ([area objectives available here](#))

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 outcomes of experiments.

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	Objectives 1-6	All assessments and student practice assignments offer opportunities for students to

	the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological and physical systems.		demonstrate content knowledge.
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 1-7	Discussions, Essay, Presentations, Infographics, Quizzes, and Assignments based on interactive simulations.
Communication	Communicate scientific knowledge, thoughts, and reasoning clearly and effectively.	Objective 7	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. This will not change over the course of the semester. Click on *Modules* and read all of the information under the *Settling In* section.

REQUIRED & RECOMMENDED COURSE MATERIALS

There is no formal textbook adoption for this course.

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 aren't permitted to discuss grade related questions outside of Canvas. You will be asked to resend the query through Canvas.

COURSE POLICIES

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.

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.

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.

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.

'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.

ASSIGNMENTS/PEER REVIEW

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 distill and analyze information you have curated.

Assignments generally have a submission phase followed by a peer review phase. Peer reviews are anonymous and assess critical thinking and evaluation skills.

ATTENDANCE, EXTENSION REQUESTS

Requirements for class attendance and make-up exams, 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

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 5), Assignments (-2), Discussions (-2), Quizzes (-2).

Assignments weights are as follows:

Assignment Group	Weight %
Assignments and New Quizzes (lowest 2 scores dropped)	40%
Classic Quizzes (lowest 2 scores dropped)	40%
Discussions (lowest 2 scores dropped)	15%
Videos: Playposit (lowest 5 scores dropped)	5%

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 with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting 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.

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

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida. The following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php>.”

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](#): Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

[Writing Studio](#): 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the [Student Honor Code and Student Conduct Code webpage](#) for more information.

On-Line Students Complaints: View the [Distance Learning Student Complaint Process](#).

FEEDBACK

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. 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.

GETTING HELP

For issues with or technical difficulties with Canvas, contact the UF Help Desk: <https://lss.at.ufl.edu/help.shtml>; (352)-392-HELP.

Other resources are available at <http://www.distance.ufl.edu/getting-help> for Counseling and Wellness resources, disability resources, resources for handling student concerns and complaints, and library desk support.

DISCLAIMER

This syllabus represents my current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

TENTATIVE 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, peer review, quizzes, new quizzes and/or interactive simulation components.

Course Orientation July 1

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 and for peer review are presented. A Discussion Board for Q&A is available for any questions.

Module 1: Chemistry and the Scientific Method (July 2 – 5)

What is chemistry, and what do chemists do?

Lesson 1 Chemistry in Context July 2

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

Lesson 2 Bad Science July 3

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

Lesson 3 Scientific Method July 5

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

Lesson 4 Scientific Method in our Everyday Lives July 5

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.

Module 2: Numbers (July 8 – 9)

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 July 8

SI units, metric prefixes and use in calculations. 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.

Lesson 2 Numbers July 9

Quiz, discussion, playposit assignments.

Module 3: The Periodic Table (July 10 – 12)

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

Lesson 1 The Periodic Table July 10

Playposit; Periodic Table Scavenger Hunt (New Quiz); Content Quiz. 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.

Lesson 2 Biography of a Chemist July 11, 12

Research a chemist; create dynamic audiovisual presentation; peer reviews.

Module 4: Compounds (July 15 – 17)

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 July 15

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

Lesson 2 Molecular Compounds July 16,17

The octet rule, writing simple Lewis structures. Formation of covalent bonds, electronegativity and bond and molecular polarity. Playposit, interactive simulation (Build a Molecule), interactive simulation assignment (Bond and Molecular Polarity); content quiz.

Module 5: Earth (July 18 – 23)

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 July 18

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. Playposit bulb and content quiz, and readings.

Lesson 2 Chemical & Physical Properties July 19

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

Lesson 3 Chemical Reactions July 22

Playposit videos, content quiz, infographic (“Oil”) and presentation with video (“Coal”). Deeper understanding of chemistry related to fossil fuel production and environmental implications. Energy diagrams and catalysis

Lesson 4 Fuel and Combustion July 23

Balancing chemical equations playposit assignment; discussion (Fuel Efficiency), content quiz.

Module 6: Air (July 24 – 26)

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 July 24,25

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

Lesson 2 Gases July 26

Playposit, guided interactive assignment (Exploring Gas Laws), content quiz. Gas behavior in terms of pressure, volume, amount and temperature; using the Kinetic Molecular Theory to describe behavior of gases.

Module 7: Fire (July 29 – 30)

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

Lesson 1 Energy July 29

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. Presentation (Energy Generation Near Me), playposit videos, content quiz.

Lesson 2 Nuclear July 30

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. Playposit videos, discussion, content quiz.

Module 8: Water (July 31 – August 2)

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 July 31, August 1

Presentation (Drinking Water Near Me, water quality, chemistry of water purification); discussion; content quiz. 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.

Lesson 2 Molarity and pH August 2

Solutions playlist; content quiz x 2. Calculations of concentration, using formula mass and molar mass, dilution, and the pH scale.

Module 9: Biochemistry (August 5 – 8)

Lesson 1 Carbohydrates August 5

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

Lesson 2 Fats August 6

Playposit and content quiz. 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.

Lesson 3 Proteins August 7

Playposit and content quiz. Amino acids and their composition.

Lesson 4 Nucleic Acids Aug. 8

Playposit, content quiz and Presentation (Genetic Modification). Nucleotides (DNA, RNA), nitrogenous bases. How genetic engineering works, why it is done, analysis of benefits vs risks.

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	6 pts Partial Marks The student describes two examples of the	3 pts Partial Marks The student describes one example of the	0 pts No Marks The student describes their example(s) of	10

	of the scientific method, identifying all required steps.	scientific method but either does not describe the examples thoroughly enough or does not identify all required steps.	scientific method but either does not describe the examples thoroughly enough or does not identify all required steps.	the scientific method poorly.	
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
Peer Review	3 pts Full Marks The student provides peer review following instructions.		0 pts No Marks Either a peer review is not completed or is not completed adhering to instructions.		3
Total					20

Oil Infographic

Criteria	Ratings	Points
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Company Name and Location	2 pts Full Marks The name and location of the company are included.	1 pts Partial Marks Either the name or location is omitted or is not specific.	0 pts No Marks	2
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
Peer Review	2 pts Full Marks The student completes two peer reviews.	1 pts Partial Marks The student completes one peer review.	0 pts No Marks The student does not complete peer reviews.	2
Total				16