

Current Information:

I. A.) DEPARTMENT NAME: Chemstry

B.) COURSE NUMBER, and TITLE: CHM 1020 Chemistry for the Liberal Arts

C.) CREDIT HOURS: 3 D.) PREREQUISITES: none

E.) CURRENT CLASSIFICATION

1. General Education Code: B C D H M N P S None

2. Writing Requirement: E2 E4 E6 None

3. Math Requirement: M None

Requests:

II. GENERAL EDUCATION

A.) Requested Classification: B C D H M N P S

B.) Effective Date: Fall Spring Summer 2014 (year)

Or

1-time Approval Fall Spring Summer _____ (year)

III. WRITING REQUIREMENT MATH REQUIREMENT

A.) Requested Classification E2 E4 E6

B.) Effective Date: Fall Spring Summer _____ (year)

Or

1-time Approval Fall Spring Summer _____ (year)

C.) Assessment:

1.) What type of feedback will be provided to the student (in reference to writing skill)?

_____ Grade _____ Corrections _____ Drafts _____ Other

2.) Will a published rubric be used? _____

IV. ATTACH A DETAILED SYLLABUS

V. SYLLABUS CHECKLIST

Courses that offer students General Education and/or Writing Requirement credit must provide clear and explicit information for the students about the classification and requirements.

For courses with a **General Education** classification, the syllabus **must** include:

- Instructor contact information (and TA if applicable)
- Course objectives and/or goals
- Student Learning Outcomes
- Required and optional textbooks
- Methods by which students will be evaluated and their grades determined
- Weekly course schedule with sufficient detail (including topics, assigned readings, assignments, due dates) that the General Education Committee may determine the appropriateness of the General Education classification requested.
- A statement related to class attendance, make-up exams and other work such as: *“Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.”*
- A statement related to accommodations for students with disabilities such as: *“Students with disabilities requesting classroom accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered students will an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.”*
- A statement informing students of the online course evaluation process such as: *“Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <http://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.”*
- Information on current UF grading policies for assigning grade points. This may be achieved by including a link to the appropriate undergraduate catalog web page <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

It is **recommended** that syllabi contain the following information:

- Critical dates for exams and other work
- Class demeanor expected by the professor (e.g. tardiness, cell phone usage)
- The university's honesty policy regarding cheating, plagiarism, etc.
Suggested wording: UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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." The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.
- Phone numbers and contact sites for university counseling services and mental health services: <http://www.counseling.ufl.edu/cwc/Default.aspx>; 392-1575, University Police Department 392-1111 or 9-1-1 for emergencies.

The University's complete Syllabus Policy can be found at:

http://www.aa.ufl.edu/Data/Sites/18/media/policies/syllabi_policy.pdf

For courses with **Writing Requirement (WR)** classification, the syllabus **must** include:

- "The Writing Requirement ensures students both maintain their fluency in writing and use writing as a tool to facilitate learning."
- "Course grades now have two components: To receive writing credit, a student must receive a grade of "C" or higher and a satisfactory completion of the writing component of the course."
- A statement or statements indicating that the instructor will evaluate and provide feedback on the student's written assignments with respect to grammar, punctuation, usage of standard written English, clarity, coherence, and organization
- Assignment word counts, page lengths, submission deadlines and feedback dates

Additionally, the syllabus must clearly show that the course meets the WR to

- Evaluate [2,000/4,000/6,000] written words in assignments during the semester
- Provide all feedback on assignments prior to the last class meeting

Important note: The following types of writing assignments **CANNOT** be used to meet the WR: teamwork, exam essay questions, take-home exams, and informal, ungraded writing assignments.

VI. SUBMISSION AND APPROVALS

Department Contact:

Contact Name: Melanie Veige

Phone 392-0518 Email melveige@chem.ufl.edu

College Contact:

College Name: _____

College Contact Name: _____

Phone _____ Email _____

CHEMISTRY FOR THE LIBERAL ARTS

CHM 1020

3 CREDITS

SPRING, 2014

"In the fields of observation, chance favors only the prepared mind." (Louis Pasteur)

ONLINE CLASS

INSTRUCTOR: Melanie Veige
CLB C130B
e-mail through Canvas only
(352) 392-0518

OFFICE HOURS: MTR 6th period online. Navigate to
<http://ufat.adobeconnect.com/veigechemistry> to participate via chat,
webcam and microphone.

COURSE TA: TBA; office hours TBA in the Chemistry Learning Center (Keene-Flint Hall,
257-258)

COURSE WEBSITE: <https://ufl.instructure.com>

COURSE DESCRIPTION: 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.

PREREQUISITE KNOWLEDGE AND SKILLS: High school algebra is necessary.

COURSE COMMUNICATIONS: General course questions should be posted to the discussion board. The course TA or instructor will respond to Discussion posts within 24 h during the work week (allow 48 h over the weekend). Private or grade-related questions should be sent to the instructor using the mail function in Canvas.

REQUIRED TEXT: You are not required to purchase one. An electronic version of the textbook (*Chemistry in Context*, 7th ed., American Chemical Society (ISBN 0077334434 / 9780077334437)) is included with your course fees. You can access the course text and homework activities immediately; click on "McGraw-Hill Campus" to get started. If you have any questions about this process, please e-mail your instructor.

ADDITIONAL REQUIREMENTS: A computer with webcam, microphone, and speakers is required. You will also need a nonprogrammable calculator.

PURPOSE OF COURSE: By the end of this course it is expected that students will have a fundamental understanding of the chemistry of the major environmental threats to air and water, including ozone depletion, smog, global climate change, and others.

COURSE STUDENT LEARNING OBJECTIVES: The student will:

- Demonstrate an understanding of basic chemical concepts, including classification of matter.
- Gain an understanding of the vocabulary of chemistry, which permeates society on food and product labels, in regards to pollution and climate change, and in the discussion of sustainable energy.
- Demonstrate the ability to apply chemistry-centered mathematical concepts effectively to real-world solutions; for example, calculating Calories in an item of food, and using half-life to assess potential dangers of radioactive isotopes.
- Communicate scientific findings clearly and effectively using oral, written or graphic forms.
- Distill and analyze information from multiple perspectives, including that presented in tabular or graphic format. The student will apply logical reasoning skills in this task.
- Describe the chemistry of the major environmental threats to air and water, including ozone depletion, smog, global climate change, groundwater pollution, and energy production.

INSTRUCTIONAL METHODS: The course material is delivered via recorded lectures by your instructor, through other instructional videos (PBS, NASA, etc.), and by key readings in the text.

COURSE POLICIES:

QUIZ/EXAM POLICY: There are timed end-of-module quizzes administered via e-Learning. The *lowest two* such quizzes are dropped (note, the midterm and final exam scores are not eligible to be dropped). The midterm and cumulative final exam will be administered via e-Learning using Assessments with remote proctoring by ProctorU. It is your responsibility to register with ProctorU and reserve an exam time within the window specified in the Due Dates schedule at least 5 days prior to each exam date. To register go to <http://go.proctoru.com>. If you fail to make a reservation in advance, you will incur a late fee, and may have difficulty obtaining a desirable exam time. Same-day

appointments are not permitted. Failure to reserve a time slot in advance is not an acceptable reason for a make-up. If you have technical difficulties, call ProctorU at 205-870-8122.

MAKE-UP POLICY: A conflict exam will be offered to those students with valid conflicts (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>). It is your responsibility to identify yourself as requiring such accommodation at least one week prior to the exam. If, during the exam, you experience technical difficulties with ProctorU, the correct course of action is to contact ProctorU at 205-870-8122. If you experience technical difficulties with e-Learning, contact the Help Desk immediately at 392-HELP. A ticket number will be created to log the time and nature of the problem. You must contact your instructor via e-mail within 24 h of the technical difficulty to be considered for a make-up. The ticket number will be required by your instructor should a make-up exam be requested.

ASSIGNMENT POLICY:

1. MCGRAW-HILL CAMPUS: There are two electronic homework components accessed via McGraw-Hill Campus: electronic homework and LearnSmart activities. The homework policies are: the student may attempt each question 3 times without penalty. Assignments may be submitted late, with a penalty of 10% per day late. All assignment scores will be final at 11:59 pm the last day of term. The lowest two homework and LearnSmart module grades are dropped.

2. END-OF-MODULE QUIZZES: There are 8 such quizzes, each of which is available under the Quizzes tool for 72 h. The lowest two quiz scores are dropped.

3. WRITTEN ASSIGNMENTS/PEER REVIEW: Three written assignments will be submitted via SWoRD.

COURSE TECHNOLOGY: The student may require Adobe Acrobat Reader, Adobe Flash Player, Microsoft Silverlight and other software; there are free tutorials on many software applications you may encounter on Lynda.com. All UF students are expected to have reliable access to a computer; suggested configurations may be found here: <https://training.helpdesk.ufl.edu/computing.shtml>. ProctorU has specific hardware/software requirements: <http://www.proctoru.com/tech.php>.

UF POLICIES:

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES: Students requesting accommodation for disabilities must first register with the Dean of Students

Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the 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: Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <http://www.dso.ufl.edu/students.php>.

NETIQUETTE: COMMUNICATION COURTESY: All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. <http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

GETTING HELP:

For issues with technical difficulties in Canvas, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

** Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

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
- Library Help Desk support

Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

GRADING POLICIES:

Should a student wish to dispute any grade received in this class (other than simple addition errors), the dispute must be in writing and be submitted to the instructor within one week of receiving the grade.

GRADE DISTRIBUTION: (1000 points total)

1. McGraw-Hill Campus (Homework and LearnSmart activities) (210 points)
2. Online Quizzes (90 points)
Time-limited end-of-chapter quizzes will be delivered in a multiple-choice, matching and fill-in-the-blank format through Quizzes in Canvas.
3. Proctored (online) Midterm (175 points) and Final (350 points) Exam
The midterm and final exam (timed, multiple-choice and fill-in-the-blank format) will be delivered through Quizzes in Canvas and will be proctored remotely by ProctorU.
4. Class Participation (39 points)
The student will regularly (approximately 2x per week) post comments/insight on assigned topics to the Discussion Board.
5. Written Assignments (85 points)
6. Blog (30 points)
The student will submit blog-type assignments for each module.
7. Group Map (15 points)
8. Syllabus Quiz (3 points)
9. Extra Credit Surveys (3 @ 1 point each)

GRADING SCALE:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
87%	84	80	77	74	70	67	64	60	56	54	<54

For more information:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx#hgrades>

<http://www.isis.ufl.edu/minusgrades.html/>

COURSE SCHEDULE:

MIDTERM AND FINAL EXAM: Reserve your exam time with ProctorU.

SUGGESTED STUDY SCHEDULE:

EXAM

QUIZ

SUN.	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT.
Jan. 5	6 Module 1	7	8	9	10	11
12	13	14	15 Module 2	16	17 Quiz 1 Module 1 Discussion #1 Homework and LS #1 Practice Homework Blog 1-3	18
19	20	21	22	23	24 Module 3 Discussion #2 Map #1 and 2	25
26	27	28 Quiz 2 Module 2 Module 2 homework and LS Blog 4-6	29	30	31 Discussion #3 Assignment #2	Feb. 1
2	3	4 Module 4	5	6 Quiz 3 Module 3 Homework and LS Blog 7-9	7 Map 3 Discussion #4 Assignment #3	8
9	10	11	12	13 Module 5	14 Map 4 Discussion #5 Survey #1	15
16	17 Quiz 4 Module 4 Homework and LS Module 4 Blog 10-12	18	19	20	21 Discussion #6 Map 5	22
23	24 Module 6	25	26 Midterm Exam: Modules 1-5 Module 5 Homework and LS Blog 13-15	27	28 Discussion #7	Mar. 1
2	3	4	5	6 Module 7	7 Discussion #8 Map 6 Assignment #4	8
9	10 Quiz 5 Module 6 Module 6 homework and LearnSmart Blog 16-18	11	12	13	14 Survey 2 Map 7 Discussion #9	15
16	17 Module 8	18	19 Quiz 6 Module 7 Module 7 HW and LS Blog 19-21	20	21 Discussion #10 Assignment #5	22
23	24	25	27 Module 9	27	28 Quiz 7 Module 8 Module 8 HW and LS Blog 22-24 Assignment #6 Map submission	29
30	31	April 1	2	3	4 Module 10 Discussion #11	5
6	7	8	9	10	11	12

		Quiz 8 Module 9 Module 9 HW and LS Blog 25-27			Discussion #12	
13	14	15	16	17	18 Module 10 HW and LS Survey #3 Discussion #13 Blog #28-30 Project energy due (Assignment #7)	19
20	21	22 Cumulative Final Exam	23	24	25	26

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.

CHM 1020 Chemistry for the Liberal Arts: Student Learning Objectives

1. Module 1

- 1) The student will classify samples of matter.
- 2) The student will convert ppm to %.
- 3) The student will rank the major components of dry air.
- 4) The student will differentiate between major pollutants based on their characteristics, sources, and effects on the body.
- 5) The student will identify sources of pollutants/VOCs to indoor and outdoor air.
- 6) The student will interpret data provided on a graph.
- 7) The student will identify regions of the periodic table, including groups, periods, metals, nonmetals and metalloids.
- 8) The student will name straight-chain hydrocarbons with 1-4 carbons, and identify number of carbon atoms in the formula from name.
- 9) The student will name molecular compounds from a formula and vice versa.
- 10) The student will balance unbalanced chemical equations.
- 11) The student will convert a phrase to a chemical equation.
- 12) The student will describe the formation of ozone, invoking involvement of NO_2 and sunlight.

2. Module 2

- 1) The student will describe the formation of O_3 in the atmosphere.
- 2) The student will identify groups of elements on the periodic table.
- 3) The student will list contributing factors to ozone hole formation.
- 4) The student will assess environmental and human factors that affect ozone depletion.
- 5) The student will define the ozone layer.
- 6) The student will identify the Lewis structure that matches a chemical formula.
- 7) The student will identify resonance structures.
- 8) The student will interconvert frequency, wavelength and energy.
- 9) The student will specify the number of protons, electrons, or neutrons from a chemical symbol.
- 10) The student will identify atomic number and mass number from a chemical symbol.
- 11) The student will distinguish between CFCs, Halons, HCFCs and HFCs.
- 12) The student will identify a free radical species.
- 13) The student will interpret the Chapman cycle of ozone formation and depletion.
- 14) The student will rank UV-A, UV-B and UV-C radiation in terms of biological damage, wavelength, and energy.
- 15) The student will rank EMR by frequency or wavelength.
- 16) The student will interpret a graph related to wavelength and energy.

3. Module 3

- 1) The student will identify processes that keep the energy of the earth in balance.
- 2) The student will distinguish between the greenhouse effect and the enhanced greenhouse effect.
- 3) The student will identify sources of greenhouse gases.
- 4) The student will predict molecular geometry and bond angles from a chemical formula of a small molecule.
- 5) The student will convert mass of a compound to moles of a compound using molar mass.
- 6) The student will convert g of a compound to # atoms using molar mass and Avogadro's number.
- 7) The student will perform calculation involving mass ratio and mass percent.
- 8) The student will evaluate factors considered in climate change prediction (radiative forcings).
- 9) The student will identify methods to mitigate climate change.
- 10) The student will identify activities that add/remove CO₂ from the atmosphere in the carbon cycle.
- 11) The student will rank the global warming potential of various greenhouse gases.
- 12) The student will interpret graphical representations of CO₂ levels and temperature change.
- 13) The student will differentiate between climate and weather.
- 14) The student will describe "carbon footprint."

4. Module 4

- 1) The student will predict molecular polarity from electronegativity values.
- 2) The student will identify regions of partial positive and partial negative charge in a polar molecule.
- 3) The student will identify unique physical characteristics of water and their effects on climate change.
- 4) The student will correlate intermolecular forces (e.g. H bonding) with physical properties.
- 5) The student will perform density calculations using mass and volume.
- 6) The student will calculate concentration in ppm, ppb, %, and molarity.
- 7) The student will predict the most likely ion an element is likely to form.
- 8) The student will identify the numbers of protons, neutrons, and electrons in an ion.
- 9) The student will classify compounds as ionic or molecular.
- 10) The student will name ionic compounds, given the formula, and generate a formula from a name.
- 11) The student will predict the solubility of ionic and molecular compounds, will correlate this with polarity, and will identify an electrolyte.

- 12) The student will correlate environmental effects with solubility.
- 13) The student will identify and describe steps involved in municipal water treatment.
- 14) The student will perform calculations involving specific heat, mass and temperature change.
- 15) The student will describe the meaning of water footprint, and why it varies with location.

5. Module 5

- 1) The student will distinguish between an acid and a base (formula or in a chemical equation).
- 2) The student will write the neutralization equation between an acid and base as the molecular equation, complete ionic equation, and net ionic equation.
- 3) The student will calculate pH values from $[\text{OH}^-]$ and/or $[\text{H}^+]$, and vice versa.
- 4) The student will rank concentrations of ions present in a particular solution.
- 5) The student will write/identify the equation for the combustion of carbon or sulfur.
- 6) The student will identify processes involved in the nitrogen cycle and will recognize the equation for the Haber-Bosch process.
- 7) The student will identify contributing factors to, and identify the effects of, ocean acidification, and will correlate environmental factors with acid-neutralizing capacity of a body of water.
- 8) The student will identify relevant chemical equations that indicate how sulfur oxides and nitrogen oxides lead to acid rain formation.
- 9) The student will identify sources of NO_x and SO_2 .
- 10) The student will rank the pH of pure water, ordinary rain, acid rain, and seawater.

6. Module 6

- 1) The student will identify methods of PE/KE conversion from ancient plant life to burning fossil fuels in a power plant.
- 2) The student will state the first and second laws of thermodynamics.
- 3) The student will perform energy calculations, employing energy units of calories and joules, grams and moles.
- 4) The student will name linear alkanes containing between 1 and 10 carbon atoms.
- 5) The student will perform calculation using thermochemical equations.
- 6) The student will evaluate whether a reaction is endothermic or exothermic.
- 7) The student will determine the heat of combustion of a reaction using bond energies.
- 8) The student will relate bond energies to potential energy and energy output in fuels.
- 9) The student will interpret the energy-reaction pathway of a catalyzed reaction involving activation energy.
- 10) The student will distinguish between heat and temperature.

- 11) The student will identify isomers from chemical formula or structural formula.
- 12) The student will compare and contrast efficiency, emissions, and effects on human health and the environment of fuel additives.

7. Module 7

- 1) The student will perform energy/mass calculations using $E=mc^2$.
- 2) The student will distinguish between alpha and beta particles and gamma rays.
- 3) The student will propose radioactive decay equations based on the radioactive decay series.
- 4) The student will compare physiological effects of radioisotopes based on half-life, type of decay, effect on body and route of entry.
- 5) The student will rank/identify sources of ionizing radiation contributing to his/her personal radiation dose.
- 6) The student will perform calculations involving units of radioactivity.
- 7) The student will perform half-life calculations, including those relating to carbon dating.
- 8) The student will contrast the risks of coal and nuclear power.
- 9) The student will describe features of a nuclear power plant.
- 10) The student will describe methods of obtaining enriched uranium.
- 11) The student will describe features of the nuclear fuel cycle.
- 12) The student will distinguish between types of nuclear waste.

8. Module 8

- 1) The student will describe the discovery of penicillin and aspirin.
- 2) The student will correlate chemical formula, structural formula, condensed structural formula, line-angle drawing, and name of an organic molecule.
- 3) The student will identify structural isomers.
- 4) The student will identify and name functional groups in a molecule.
- 5) The student will differentiate between hormones, enzymes, and steroids.
- 6) The student will describe the lock-and-key model for biological interactions.
- 7) The student will identify chiral carbon centers in molecules, from chemical formula, structural formula, condensed structural formula, or line-angle drawing.
- 8) The student will correlate solubility of a molecule with type of functional group in a molecule.
- 9) The student will predict the product of an esterification reaction given the reactants.

9. Module 9

- 1) The student will differentiate between lipids, carbohydrates and proteins by their structural formulas and other characteristics.

- 2) The student will distinguish between oils, fats, triglycerides, and lipids.
- 3) The student will predict fatty acid formed from 3 fatty acids and glycerol (general ester formation).
- 4) The student will differentiate between saturated and unsaturated fatty acids.
- 5) The student will correlate structure to melting point of a fatty acid.
- 6) The student will differentiate between *cis* and *trans* isomers.
- 7) The student will differentiate between sugars, starch and cellulose, by structural formulas and properties.
- 8) The student will identify a monosaccharide, disaccharide and polysaccharide from structural formula.
- 9) The student will identify an amino acid from structural formula.
- 10) The student will predict number of dipeptides/tripeptides formed from a given number of amino acids.
- 11) The student will differentiate between essential amino acids and nonessential amino acids, including sources thereof.
- 12) The student will differentiate between vitamins based on their physiological effects.
- 13) The student will perform calculations using BMR, Calories in food, etc.
- 14) The student will identify sections of the USDA food pyramid.
- 15) The student will differentiate between natural and artificial sweeteners.

10. Module 10

- 1) The student will assess arguments for and against GM crops.
- 2) The student will identify the 3 units of DNA from a structural formula or other depiction of a monomer/polymer/helix.
- 3) The student will identify potential H-bonding sites on a base.
- 4) The student will write a complementary base sequence to a given sequence.
- 5) The student will describe the ways in which genetic engineering is used for pharmaceuticals and polymer production.
- 6) The student will differentiate between a monomer and polymer of DNA.
- 7) The student will differentiate between primary, secondary and tertiary protein structure.
- 8) The student will correlate disease with amino acid substitution in a protein.

DUE DATES, Spring 2014

Week	Assignment	Description/Notes	Date Due	Points (1000)	Bonus Points	Done
Week 1 Begins 01/05	Reading	Begin Chapter 1	Monday 01/06			
Week 2 Begins 01/12	Handbook/ Syllabus Quiz	Complete Syllabus Quiz. Available immediately.	Monday 01/13 11:59 pm	3		
	Reading	Begin Chapter 2	Wednesday 01/15			
	Practice Homework	Complete Practice Homework assignment in McGraw-Hill Campus. These practice problems instruct you in the proper method to enter values, symbols and to draw structures. The McGraw-Hill assignments will not be hand-graded; <i>you must enter information correctly to receive credit on Homework assignments.</i>	Friday 01/17 11:59 pm	10		
	Module 1 Homework	Complete Connect homework for Chapter 1.	Friday 01/17 11:59 pm	20		
	Module 1 LearnSmart	Complete LearnSmart module for Chapter 1.	Friday 01/17 11:59 pm	5		
	Module 1 Quiz	This is a timed quiz. You must have watched the lecture video(s) and read the book chapter prior to taking the quiz. Available 01/15.	Friday 01/17 11:59 pm	15		
	Disc. Board #1	Select your Group Leader for mapping activities. Start collaborating on your group map.	Friday 01/17 11:59 pm	3		
	Blog	Module 1 Blog Entries #1-3 due. Post 3 entries including comments/photos of recent news articles related to pollution.	Friday 01/17 11:59 pm	3		
Week 3 Begins 01/19	Assignment #1	Collaboration leader/group leader.	Monday 01/20 11:59 pm	5		
	Reading	Begin Chapter 3	Friday 01/24			
	Discussion #2	Post your statement regarding interplay of variables on AQI.	Friday 01/24 11:59 pm	3		
	Module 1 and 2 Map Activity	Map a location with poor AQI and a location under the ozone hole. The completed map will be worth 10 points.	Friday 01/24 11:59 pm			
Week 4 Begins 01/26	Module 2 Homework	Complete Connect homework for Chapter 2.	Tuesday 01/28 11:59 pm	20		
	Module 2 LearnSmart	Complete LearnSmart module for Chapter 2.	Tuesday 01/28 11:59 pm	5		
	Module 2 Quiz	This is a timed quiz. You must have watched the lecture video(s) and read the book chapter prior to taking the quiz. Available 01/26.	Tuesday 01/28 11:59 pm	15		
	Blog	Module 2 Blog Entries #4-6 due. Post 3 entries including comments/photos of recent news	Tuesday 01/28 11:59 pm	3		

		articles related to the ozone hole or ozone depletion.				
	Disc. Board #3	Provide the UV index where you are and comments.	Friday 01/31 11:59 pm	3		
	Assignment #2	Point form experimental procedure for AQI investigation submitted to instructor.	Friday 01/31 11:59 pm	5		
Week 5 Begins 02/02						
	Reading	Begin Chapter 5.	Tuesday 01/14			
	Module 3 Homework	Complete Connect homework for Chapter 3.	Thursday 02/06 11:59 pm	20		
	Module 3 LearnSmart	Complete LearnSmart module for Chapter 3.	Thursday 02/06 11:59 pm	5		
	Module 3 Quiz	This is a timed quiz. You must have watched the lecture video(s) and read the book chapter prior to taking the quiz. Available 02/04.	Thursday 02/06 11:59 pm	15		
	Blog	Module 3 Blog Entries #7-9 due. Post 3 entries including comments/photos of recent news articles related to climate change or global warming.	Thursday 02/06 11:59 pm	3		
	Module 3 Map Activity	Map a location in which climate change is evident.	Friday 02/07 11:59 pm			
	Disc. Board #4	Is global warming preventable?	Friday 02/07 11:59 pm	3		
	Assignment #3	Complete Report on SmogCity investigation and upload to SWORD.	Friday 02/07 11:59 pm	25 total		
Week 6 Begins 02/09						
	Reading	Begin Chapter 4	Thursday 02/13			
	Module 4 Map Activity	Map a location that suffers from poor water availability.	Friday 02/14 11:59 pm			
	Disc. Board #5	What's your carbon footprint?	Friday 02/14 11:59 pm	3		
	Survey #1	Complete survey. Full credit is awarded upon successful completion. Available for 02/12..	Friday 02/14 11:59 pm	1		
<i>Reserve your Midterm Exam time with ProctorU.</i>						
Week 7 Begins 02/16						
	Module 4 Homework	Complete Connect homework for Chapter 5.	Monday 02/17 11:59 pm	20		
	Module 4 LearnSmart	Complete LearnSmart module for Chapter 5.	Monday 02/17 11:59 pm	5		
	Module 4 Quiz	This is a timed quiz via Assessments in e-Learning. You must have watched the lecture video(s) and read the book chapter prior to taking the quiz. Available 02/15.	Monday 02/17 11:59 pm	15		
	Blog	Module 4 Blog Entries #10-12 due. Post 3 entries including comments/photos of recent news articles related to water quality or water availability.	Monday 02/17 11:59 pm	3		
	Module 5 Map Activity	Map a location that frequently has poor visibility or haze.	Friday 02/21 11:59 pm			
	Disc. Board #6	What is your water footprint?	Friday 02/21 11:59 pm	3		
	SWORD	Peer Reviews due in SWORD.	Friday 02/21			

			11:59 pm			
Week 8 Begins 02/23	Reading	Begin Chapter 4	Monday 02/24 11:59 pm			
	Module 5 Homework	Complete Connect homework for Chapter 6.	Wednesday 02/26 11:59 pm	20		
	Module 5 LearnSmart	Complete LearnSmart module for Chapter 6.	Wednesday 02/26 11:59 pm	5		
	Blog	Module 5 Blog Entries #13-15 due. Post 3 entries including comments/photos of recent news articles related to acid rain or ocean acidification.	Wednesday 02/26 11:59 pm	3		
	Midterm Exam	You must have a reservation with ProctorU in advance. The exam covers Modules 1-5 (Chapters 1-3 and 5-6). The exam is timed, and is proctored remotely by ProctorU. Log into the ProctorU website; the proctor will walk you through the set-up process, verify your identity, and log you into the password-protected midterm exam.	Wednesday 02/26-Thursday 02/27	175		
	Disc. Board #7	Statement regarding molecules and light.	Friday 02/28 11:59 pm	3		
	SWoRD	Back-evaluations due in SWoRD.	Friday 02/28 11:59 pm			
Week 9 Begins 03/02	Reading	Begin Chapter 7	Thursday 03/06			
	Disc. Board #8	How is energy harnessed where you live?	Friday 03/07 11:59 pm	3		
	Module 6 Map Activity	Map a location in which new methods of energy generation are being tried.	Friday 03/07 11:59 pm			
	Assignment #4	Submit point form outline of molecules and light experiment.	Friday 03/07 11:59 pm	5		
Week 10 Begins 03/09	Module 6 Homework	Complete Connect homework for Chapter 4.	Monday 03/10 11:59 pm	20		
	Module 6 LearnSmart	Complete LearnSmart module for Chapter 4.	Monday 03/10 11:59 pm	5		
	Module 6 Quiz	This is a timed quiz. You must have watched the lecture video(s) and read the book chapter prior to taking the quiz. Available 03/08.	Monday 03/10 11:59 pm	15		
	Blog	Module 6 Blog Entries #16-18 due. Post 3 entries including comments/photos of recent news articles related to energy generation.	Monday 03/10 11:59 pm	3		
	Survey #2	Complete survey. Full credit is awarded upon successful completion. Available 03/12.	Friday 03/14 11:59 pm	1		
	Module 7 Map Activity	Select a location that has nuclear reactors.	Friday 03/14 11:59 pm			
	Disc. Board #9	What is your personal radiation dose?	Friday 03/14 11:59 pm	3		
Week 11 Begins	Reading	Begin Chapter 10	Monday 03/17			
	Module 7	Complete Connect homework for Chapter 7.	Wednesday	20		

03/16	Homework		03/19 11:59 pm			
	Module 7 LearnSmart	Complete LearnSmart module for Chapter 7.	Wednesday 03/19 11:59 pm	5		
	Module 7 quiz	This is a timed quiz. You must have watched the lecture video(s) and read the book chapter prior to taking the quiz. Available 03/17.	Wednesday 03/19 11:59 pm	15		
	Blog	Module 7 Blog Entries #19-21 due. Post 3 entries including comments/photos of recent news articles related to nuclear power or nuclear weapons.	Wednesday 03/19 11:59 pm	3		
	Disc. Board #10	Comment on your radiation exposure post-Fukushima.	Friday 03/21 11:59 pm	3		
	Assignment #5	Molecules and Light Report due in SWORD.	Friday 03/21 11:59 pm	25 total		
Week 12 Begins 03/23	Reading	Begin Chapter 11	Wednesday 03/27			
	Module 8 quiz	This is a timed quiz. You must have watched the lecture video(s) and read the book chapter prior to taking the quiz.	Friday 03/28 11:59 pm	(drop 2 lowest)		
	Module 8 Homework	Complete Connect homework for Chapter 10.	Friday 03/28 11:59 pm	20		
	Module 8 LearnSmart	Complete LearnSmart module for Chapter 10.	Friday 03/28 11:59 pm	5		
	Assignment #6	Submit a copy of your group's completed Google Map (Assignments Tool).	Friday 03/28 11:59 pm	10		
	Blog	Module 8 Blog Entries #22-24 due. Post 3 entries including comments/photos of recent news articles related to drug development/approval or side effects	Friday 03/28 11:59 pm	3		
	SWORD	Peer review due for Molecules and Light.	Friday 03/28 11:59 pm			
Week 13 Begins 03/30	Reading	Begin Chapter 12	Friday 04/04			
	Disc. Board #11	Give a unique example of a drug and discuss its functional groups.	Friday 04/04 11:59 pm	3		
	SWORD	Back-evaluation deadline for Molecules and Light	Friday 04/04 11:59 pm			
	SWORD	Submission of Energy assignment to SWORD (Assignment #7).	Friday 04/04 11:59 pm	25 total		
Week 14 begins 04/06	Module 9 quiz	This is a timed quiz. You must have watched the lecture video(s) and read the book chapter prior to taking the quiz. Available 04/06.	Tuesday 04/08 11:59 pm	(drop 2 lowest)		
	Module 9 Homework	Complete Connect homework for Chapter 11.	Tuesday 04/08 11:59 pm	(drop 2 lowest)		
	Module 9 LearnSmart	Complete LearnSmart module for Chapter 11.	Tuesday 04/08 11:59 pm	(drop 2 lowest)		
	Blog	Module 9 Blog Entries #25-27 due. Post 3 entries including comments/photos of recent news articles related to nutrition, obesity,	Tuesday 04/08 11:59 pm	3		

		HFCS, etc. <i>If the entries are not separate posts, you will not receive full credit.</i>				
	Disc. Board #12	Food diary.	Friday 04/11 11:59 pm	3		
	SWORD	Review deadline for Energy assignment.	Friday 04/11 11:59 pm			
<i>Reserve your Final Exam time with ProctorU.</i>						
Week 15 Begins 04/13	Module 10 Homework	Complete Connect homework for Chapter 12.	Friday 04/18 11:59 pm	(drop 2 lowest)		
	Module 10 LearnSmart	Complete LearnSmart module for Chapter 12.	Friday 04/18 11:59 pm	(drop 2 lowest)		
	Disc. Board #13	Are you pro or con GM foods?	Friday 04/18 11:59 pm	3		
	Survey #3	Complete survey. Full credit is awarded upon successful completion. Available 04/16.	Friday 04/18 11:59 pm	1		
	Blog	Module 10 Blog Entries #28-30 due. Post 3 entries including comments/photos of recent news articles related to genetic engineering.	Friday 04/18 11:59 pm	3		
	SWORD	Back-evaluation deadline for energy assignment.	Friday 04/18 11:59 pm			
Week 16 Begins 04/20	Final Exam	You must have a prior reservation with ProctorU. The exam is <i>cumulative</i> . The exam is timed, and is proctored remotely by ProctorU. Log into the ProctorU website; the proctor will walk you through the set-up process, verify your identity, and log you into the password-protected final exam.	Tuesday 04/22 – Wednesday 04/23	350		
	Official UF Course Evaluation	https://evaluations.ufl.edu				

Overview of assignments that explicitly address hypothesis formation and other aspects of the scientific method in CHM 1020

The Written Assignments listed in the syllabus are step-wise submissions of three written assignments, designed to have the students think critically about a particular topic currently being covered in the course. The first two function following the same procedure, outlined below. The third is a synthesis assignment, in which the student uses data generated over the course of the semester

1. The students are directed to diverse interactive activities that explore the scientific method and remind the students how to construct and interpret a basic graph (see list on next page).
2. The students are provided with some guiding information, but are largely left to their own devices to decide what precisely they would like to study (which variables) and what they think the outcome will be. In each case, the students first submit a hypothesis statement to a Discussion Board, and it is graded according to a rubric. Before grading by the instructor, the students are required to comment critically on the statements of their peers, using the rubric as a guide.
3. The students modify their hypotheses if necessary, and design their experiments prior to being given access to an experimental simulation. They are required to submit a point-form experimental procedure, which is graded for completeness, interplay of variables, and spelling and grammar.
4. The students receive comments/feedback from the instructor prior to conducting the experiment and submitting a full report of their work.
5. The student is given access to the simulation, and performs the experiment. He/she submits a 1-2 page lab report for peer grading. The peer review process adheres as closely as possible to the rubric provided.

The third assignment is a synthesis assignment. Over the first two thirds of the semester, the students work in groups on a map, using Google Maps. They are tasked with plotting locations that meet certain criteria (poor air quality, low water availability, etc.). A group of 10 students will generate 70 data points, color coded for each criterion. The students also contribute to weekly discussions relating to the same topics, and submit individual blog-type assignments in which they provide insightful, reflective comments on current events related to the same topics, including graphics and/or other multimedia.

The student is then tasked with referring to his/her raw data (the group map) and general knowledge/understanding of the topics, deepened by the discussions and the blog assignments, to propose a desirable form of energy production for a particular country. The student must refer to his/her raw data to justify the proposal. Each group is given the opportunity to provide feedback to group members on their hypotheses, which are generated from the same data set.

Interactive simulations and activities

1. Graph construction and interpretation
 - a. [Interpreting graphs](#)
 - b. [Graphs, charts and tables](#)
 - c. [Distance and time graphs](#)
2. Scientific method interactive activities
 - a. [Scientific method and astronomy](#)
 - b. [Controlled experiments](#)
 - c. [The cricket experiment](#)
3. Scientific method quiz
 - a. [Scientific method quiz](#)
 - b. [Scientific method quiz II](#)

Hypothesis Grading Rubric

	Outstanding (2)	Satisfactory (1)	Unsatisfactory (0)
Measurable Variables	The independent and dependent variables are measurable.	One of the variables is measurable.	The variables are not measurable.
Hypothesis Relevance	The hypothesis is based on the information provided in the assignment.	The hypothesis is related to but is not based on the information provided in the assignment.	The hypothesis is not clearly related to the information provided in the assignment.
Hypothesis Variables	The hypothesis includes both the independent and dependent variables.	The hypothesis includes only one of the independent and dependent variables.	The hypothesis does not clearly include specific variables.
Hypothesis Testable	The hypothesis is worded in such a way that it can be tested in the experiment.	The hypothesis is not worded such that it can be tested in the experiment.	The hypothesis is overly vague, and not clearly testable.
Hypothesis Overall	Hypothesized relationship between the variables and the predicted results is clear and reasonable based on what has been studied and the information provided.	Hypothesized relationship between the variables and the predicted results is reasonable based on general knowledge and information.	Hypothesized relationship between the variables and the predicted results has been stated, but appears to be based on flawed logic.
Peer Review	The student's comments insightfully and completely address the grading criteria and provide useful feedback to the author.	The student's comments do not completely address the grading criteria, or the comments are not useful in terms of feedback for the author.	The student's comments are superficial.

Point Form Procedure Grading Rubric

	Outstanding (2)	Satisfactory (1)	Unsatisfactory (0)
Completeness	The variables are clearly defined. The hypothesis is clearly stated. A procedure is outlined in point form, involving interplay of the variables. The author has clear intent.	The procedure is vaguely described, and/or the variables are not clearly defined. The hypothesis statement may be unclear.	The hypothesis is absent or the variables are not expressed. The procedure may be overly brief.
Language	There are no obvious errors in sentence structure, grammar, spelling, punctuation and/or word choice.	There are 3 or fewer errors in sentence structure, grammar, spelling, punctuation and/or word choice.	There are many (more than 3) errors in sentence structure, grammar, spelling, punctuation and/or word choice.

Assignment #1 Final Report Grading Rubric

Section	Excellent	Good	Fair	Unsatisfactory
Title	Relevant title gives insight into the experiment.	Title provided, lacks clarity.	A generic title is provided.	No title is provided.
Background Information	Variables are discussed and topic is introduced concisely.	Variables are discussed and topic is introduced.	Background information is lacking.	No background information is provided.
Spelling/Grammar	There are no spelling/grammar errors.	There are with 2 or fewer spelling/grammar errors.	There are 3 or 4 errors in spelling/grammar.	There are 5 or more spelling/grammar errors.
Hypothesis	Hypothesis stated correctly. Includes a specific prediction using defined variables.	Hypothesis stated correctly, but is vague. The variables may be defined.	Hypothesis is not stated correctly.	No hypothesis statement.
Procedure	Steps are described in a concise, cohesive paragraph.	Steps are detailed in a concise but not necessarily cohesive paragraph.	Steps are detailed in point form but some are missing, or there are 3 or 4 spelling/grammar errors.	The outline is incomplete.
Data/Results	Data and results are complete and organized. Data is labeled and easy to follow in an organized table.	Data is complete but is disorganized, not labeled, or difficult to follow.	Data is incomplete and/or highly disorganized.	Data and results are incomplete.
Analysis	Data is presented in computer-generated graphical format with clearly defined axes, including units, with proper placement of independent and dependent variable(s). Results are analyzed in a short paragraph with specific reference to the data.	Data is presented in graphical format with defined axes, with proper placement of independent and dependent variable(s). Results are explained, but explanations may be unclear and data may not be referred to specifically.	Data is presented in graphical format, but graph may be hand-drawn, axes may not be labeled, or variables are on wrong axes. Incomplete or erroneous explanation of results.	There is no graph. Analysis is overly brief or missing, without reference to data.
Conclusions	Conclusions are described perfectly.	Conclusion is generally strong but missing details.	Conclusion is very unclear.	Conclusion is overly brief or missing.

Formatting	Sections have headings; font size is 12 pt, normal margins; two pages maximum.	One element of improper formatting.	Two elements of improper formatting.	Three elements of improper formatting.
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Assignment #2 Final Report Grading Rubric

Section	Excellent	Good	Fair	Poor
Title	Relevant title gives insight into the experiment	Title provided, lacks clarity (2)	A generic title is provided (1)	No title is provided (0)
Background Information	Lewis structures are provided for all 7 molecules, including lone pair electrons. All are correct. (5)	Lewis structures are provided for all 7 molecules. There are two or fewer omissions (i.e. missing lone pair electrons) or errors. (3)	Lewis structures are provided for all molecules. There are 3 or more errors. (1)	Lewis structures are not provided for all molecules. (0)
	Molecular geometry indicated for all 7 molecules, no errors. (3)	Molecular geometry indicated for all 7 molecules, two or fewer errors. (2)	Molecular geometry indicated for all molecules, three or more errors. (2)	Molecular geometry not provided for all molecules. (0)
	Polarity indicated for all 7 molecules, no errors. (3)	Polarity indicated for all 7 molecules, two or fewer errors. (2)	Polarity indicated for all molecules, three or more errors. (2)	Polarity not provided for all molecules. (0)
Hypothesis	Hypothesis stated correctly. Includes a specific prediction using defined variables. (5)	Hypothesis stated correctly, but is vague. The variables may be defined. (3)	Hypothesis is not stated correctly. (1)	No hypothesis statement. (0)
Procedure	Steps are detailed in point form without errors in spelling/grammar. (3)	Steps are detailed in point form with 2 or fewer errors in spelling/grammar. (2)	Steps are detailed in point form but some are missing, or there are 3 or 4 spelling/grammar errors. (1)	The outline is incomplete and/or has 5 or more spelling/grammar errors. (0)
Data/Results	Data and results are complete and organized. Data is labeled and easy to follow in an organized table. (5)	Data is complete but is disorganized, not labeled, or difficult to follow. (3)	Data is incomplete and/or highly disorganized. (1)	Data and results are incomplete. (0)
Analysis	Results are analyzed in a short paragraph free of	Results are explained, but explanations may be unclear	Incomplete or erroneous explanation of results, or	Analysis is overly brief or missing, without reference to

	spelling/grammar errors, with specific reference to the data. (5)	and data may not be referred to specifically; two or fewer spelling/grammar errors. (3)	analysis has 3 or 4 spelling/grammar errors. (1)	data, or has 5 or more spelling/grammar errors. (0)
Conclusions	Conclusions are described, with no spelling/grammar errors. (5)	Conclusion is generally strong but missing details; there may be 2 or fewer spelling/grammar errors. (3)	Conclusion is very unclear, and may contain 3 or 4 spelling/grammar errors. (1)	Conclusion is overly brief or missing, or has 5 or more spelling/grammar errors. (0)
Formatting	Sections have headings; font size is 12 pt, normal margins; two pages maximum. (3)	One element of improper formatting. (2)	Two elements of improper formatting. (1)	Three elements of improper formatting. (0)

Assignment #3 Final Report Grading Rubric

	OUTSTANDING (5)	AVERAGE (3)	NEEDS WORK (1)	UNSATISFACTORY (0)
Spelling and Grammar	There are no obvious errors in sentence structure, grammar, spelling, punctuation and/or word choice.	There are 3 or fewer errors in sentence structure, grammar, spelling, punctuation and/or word choice.	There are many (4 or 5) errors in sentence structure, grammar, spelling, punctuation and/or word choice.	There are 5 or more errors in sentence structure, grammar, spelling, punctuation and/or word choice.
Specifics	The location and form of energy are clearly expressed within the first paragraph. The suitability of the energy source for the specific location is discussed. The purpose of the paper is clearly stated.	The location or energy source is vaguely expressed. The suitability of the energy source for the specific location may not be clear. The purpose of the paper may be vaguely expressed.	The location, and/or energy source are vaguely expressed or omitted entirely. Suitability of the form of energy to the location is omitted.	The location and energy source are omitted. Suitability of the form of energy is omitted.
Data	Specific reference is made to the group map and to the author's blog submissions. The proposal is clearly related to the data.	Specific reference is made to the group map; reference may be made to the author's blog submissions.	The group map and/or the blog submissions are referenced. The proposal is not clearly related to the data.	Reference is not made to the group map.
Environmental Impacts	Three or more environmental impacts of the production plant specific to the location	Fewer than three specific environmental impacts are discussed. The impacts are	Only one specific environmental impact is discussed. The impact is	Either no environmental impacts are provided, or the impact(s) is/are vaguely

	and type of energy are discussed. One or more relevant chemical equations are included.	specific to the location and type of energy. At least one relevant chemical equation is included.	specific in terms of location and type of energy. At least one chemical equation is included, but its relevance may be unclear.	expressed in terms of location and type of energy. Chemical equations are omitted.
Insight	The authors discuss the novelty of the energy source in the specific location. Specific potential challenges are addressed, as are specific methods of mediation (e.g. funding from a global or local agency). Economic factors are discussed.	The authors discuss the novelty of the energy source but perhaps not specifically in terms of location. Potential challenges are addressed, as are methods of mediation (e.g. funding from a global or local agency), but perhaps not specifically. Economic factors may be omitted or discussed in vague language.	The authors discuss the novelty of the energy source without specificity as to location. Either potential challenges or methods of mediation (e.g. funding from a global or local agency) may be omitted. Economic factors may be omitted or discussed in vague language.	The novelty of the energy source is either not discussed or is discussed in general terms. Potential challenges and/or methods of mediation are omitted. Economic factors are not discussed.
Overall	The authors creatively provide comprehensive insight, understanding, and reflective thought about the topic. The authors present a focused and cohesive viewpoint that is substantiated by effective supporting examples/information (5 or more references) to relevant, current websites or documents that enhance the information presented.	The authors provide minimal insight, understanding, and reflective thought about the topic. The authors present a specific viewpoint but lack supporting examples or information (2 to 5 references). Not all information presented enhances the point of view.	The authors show no evidence of insight, understanding, or reflective thought about the topic. The authors present few supporting examples/information (<2 references). The information provided does not add to the point of view. The document does not stimulate dialogue or commentary, and does not connect with a tourism audience.	No references. Poor cohesion. Uncertain purpose.

Written Assignment #1

Consider the following:

1. Energy sources: wind/solar, coal-fired power plant
2. Cars and Trucks
3. Other vehicles: airplanes, trains, tractors, etc.
4. Consumer products: paint, adhesives, gasoline
5. Industry: manufacturing, refineries, agriculture
6. Population
7. Temperature
8. Weather: cloud cover

All of these factors have an impact on the Air Quality Index (AQI) of a city, which includes ground-level ozone levels.

1. How would you expect the interplay of two of these variables to affect the AQI? For example, what would happen to the AQI if the population was sustained at a low level but use of cars and trucks was very high for that population? Rephrase the question as an "if...then" statement: "If the population is sufficiently low, then increasing use of cars and trucks will not increase the AQI to unhealthy levels."
2. Post your statement to the relevant Discussion Board forum (Discussion #2). You must post to the Discussion Board before you can read other posts.
3. Evaluate statements of your peers. Are they testable scenarios? Are the relevant variables clearly defined? Comment on your peers' posts using the rubric provided.
4. After reviewing feedback on your statement, you may choose to make modifications to it.
5. Consider how you might test your scenario experimentally. Describe your experiment in point form and submit a copy to the instructor (Assignment #2).

Becomes available after assignment submission:

6. Access the SmogCity2 simulation at www.smogcity2.com. Use this interface to conduct the experiment you've outlined. Each variable can be controlled using the menu on the left. There are no values assigned to each variable, so you must assign values to them. Make sure you specify the range in values you have assigned to each variable used. Organize your data in tabular format.
7. Construct a graph that illustrates the effects of the variables on AQI. If possible, derive an equation that expresses the mathematical relationship between your variable(s) of choice and the AQI of Smog City.
8. Analyze your results in a paragraph, with specific reference to your data. What conclusions can be drawn from your data? Do your results warrant further experimentation?
9. Assemble all of the above information as an organized laboratory report. Do not use the terms "I", "me" or "we." Write in complete sentences. Everything must be computer-generated (graphs, tables, etc.). The entire report should be no more than 2 pages (8.5" x 11") in length,

with standard margins and 12 pt. font. Save it as a .pdf document and submit it to SWORD for peer review. The assignment will be graded by your peers according to the rubric.

Written Assignment #2

1. Consider the following molecules: CO, N₂, O₂, CO₂, H₂O, N₂O, O₃
2. Sketch the Lewis structure for each molecule. Specify the three-dimensional geometry and polarity (if any) for each. Organize this information in a table.
3. Arrange the following types of radiation in order of increasing energy: microwave, infrared, visible and ultraviolet.
4. Consider how each molecule might interact with the four types of radiation. Frame your response as a scientific hypothesis. You might choose to word your hypothesis as an "if...then" statement. For example, "If the molecules of interest are exposed to radiation of sufficient energy, then their bonds will break."

There are many variables to consider, and many potential possible paths of scientific inquiry.

Post your statement to the Discussion Board.

Read the posts of your classmates and evaluate them using the hypothesis rubric. Provide feedback on their hypotheses, using the rubric as a guide. Are their hypotheses testable? Is it clear which variables are to be studied?

After reviewing feedback on your own statement, you may choose to make modifications to it.

5. Given samples of the molecules and sources of each type of radiation, outline the experiment you would perform to evaluate your prediction in point form. In scientific inquiry it is often valuable to conduct repeats of a particular experiment. You may wish to consider radiation over a period of time, or iterations of exposure to a radiation source. Submit a copy of the outline to your instructor (Assignment #4).

Becomes available after assignment submission:

1. Access the simulation at: <http://phet.colorado.edu/en/simulation/molecules-and-light>.

Use this interface to conduct your scientific experiment. Organize your data in tabular format.

2. What was the outcome of your experiment? Analyze your results in a paragraph, with specific reference to your data. Draw a conclusion from your data. Do your results warrant further experimentation?
3. Compile your data, from Steps 1 through 7, into an organized laboratory report. The entire report should be no more than 2 pages (8.5" x 11") in length. Save it as a .pdf document and submit to SWORD. The assignment will be graded by your peers according to the attached rubric.

Written Assignment #3

Consider the following:

1. Your group's Google Map that pinpoints areas of concern for pollution, water availability, and energy production worldwide.
2. Information from Modules 1 through 7, including that provided on the discussion boards and in your blog submissions
1. Select a country whose name begins with one of the first three letters of your first name. *For example, a student named Amanda Smith would select a country beginning with A or M.*
2. Propose a desirable form of energy production for your country. Refer to your group's Google Map, and consider everything we've discussed regarding water, energy, air, pollution, etc. What would be the best choice of energy production in your assigned country, and why? Post your proposal to your group's discussion board. Read the posts of your classmates and evaluate them using the hypothesis rubric. Provide feedback on their hypotheses, using the rubric as a guide.
3. Write a one-page report that attempts to justify your hypothesis. Does your location naturally support the energy form you have chosen? What environmental impacts may stem from your production plant? Will you require a large volume of water (for cooling towers), or will you produce large quantities of greenhouse gases? If so, will this be particularly detrimental to your country? Include references to your Google Map, and use chemical equations if and when appropriate.
4. The report will be graded according to the rubric specific for this activity. The report (Assignment #7) must fit on a single 8.5" x 11" page, with normal margins and 12 pt. font. It must be typed, and must be written formally (no "I", "we", "you", etc.).
5. The report will be submitted to SWoRD for peer review.