

Science of Contemporary Issues
CHEMISTRY 1002-01, Winter 2014
SYLLABUS, POLICIES, AND PROCEDURES

Lectures: M/W 12:00-1:30, 254 Sturm

Labs: M-W 2:00-4:50 pm or 6:30-9:20 pm, BW15

Professor: Candace Kristensson, PhD

Office Location: Olin 205A

E-mail: Candace.kristensson@du.edu

Telephone: 303-871-2985

Office hours: If my availability changes, an update will be provided in class or via Blackboard. I will be available after lectures in Sturm Mon/Wed 1:30-2:00, Tues/Thurs 11:30-12:00 and by appointment.

Teaching Assistants:

Sarah Ryan, Monday Labs, Office and Office Hours TBD sarah.ryan@du.edu

Hilary Weismiller, Tuesday Labs, Office and Office Hours TBD hilary.weismiller@du.edu

Carrie Moon, Wednesday Labs, Office 259 Mudd, Office Hours Thurs 8-10:50AM or by appt, carrie.moon@du.edu

COURSE WEBSITES

<http://blackboard.du.edu>

course handouts, labs, announcements, etc. Check this site daily for info. Access Blackboard directly, not through webcentral.

CONNECT: Please access your online homework directly from Blackboard. You are required to register online for access to this site. If you purchased the bundled package of required text from the bookstore, your registration code for the class is contained in those materials.

REQUIRED MATERIALS

A. **“Chemistry in Context: Applying Chemistry to Society”, 7th Edition**, Catherine Middlecamp, Published 2012, McGraw Hill. EBook is also available, see below

B. **Connect:** McGraw Hill’s web-based homework and assignments. Access codes can be purchased with the book or **ConnectPlus** is homework and an eBook. Access through **Connect** will be possible through blackboard, but you will need to complete the registration

process using your access code. **You will need to register again this quarter! DO THIS THROUGH BLACKBOARD SINGLE SIGN ON FOR GRADING TO WORK!**

C. **Clicker:** for class participation by TurningPoint ISBN: 9781934931400 (you are also required to register your clicker online using Blackboard’s TurningPoint Tool, if you were in the course last year and using the same clicker, there is no need to register it again).

D. **Scientific calculator.** An inexpensive calculator is required. It should have the capabilities for square roots, logarithms, and exponential (scientific) notation operations. The calculator is needed for problem sets, quizzes, and exams. BRING IT WITH YOU TO EVERY CLASS AND LAB. TI-Inspire and cell phone calculators are not acceptable.

OTHER IMPORTANT DU RESOURCES

Disability Services Program.

Provides accommodations at no cost to all qualified students.

<http://www.du.edu/studentlife/disability/dsp/>

Learning Effectiveness Program

Provides academic support services beyond basic academic accommodations.

<http://www.du.edu/studentlife/disability/lep>

The Health and Counseling Center.

Free and confidential

<http://www.du.edu/duhealth/counseling/>

Office of Student Conduct

Honor Code Statement: www.du.edu/honorcode

Student Conduct Policies and Procedures

<http://www.du.edu/studentlife/ccs/policies>

Course overview

This is the second course of a three course series. This course is dedicated to understanding chemistry as it applies to the environment on which we depend for fuel and energy. In that context, we will learn about fossil fuels, biofuels, and nuclear fuels. Along the theme of energy, we will also be examining energy storage and access, therefore batteries, fuel cells, wind and solar energy. This course assumes you have a foundation of the chemical principles developed in the first course.

Beside your involvement in the lecture component of this course, you are required to participate in the **laboratory component**. The laboratory is an important part of the course and experiments have been selected to support your learning of topics covered in the lecture. The laboratory work will solidify your study of chemistry through experimentation, data collection, and analysis.

Course goals

The course aims to improve your scientific understanding, more specifically your chemical literacy. At the completion of this course you will be able to:

- Articulate concepts and principles in chemistry and effectively apply scientific methods to ask questions, design and perform experiments, or judge arguments. Thereby increasing your ability to make better-informed decisions about science related personal and social issues.
- Recognize science as a process that considers uncertainty when drawing conclusions from scientific evidence and making predictions from existing data.
- Apply and distinguish between qualitative and quantitative forms of analysis and evidence, and demonstrate skills for using and interpreting quantitative information in various formats based on validation and replication of results.

As a team, we will work to achieve the above goals by:

- learning and using chemical terms
- increasing your understanding of the chemical basis of many natural phenomena
- developing data analysis and scientific thinking skills
- applying your knowledge to identify and solve problems
- developing your laboratory skills
- enhancing your scientific communication skills

Content is important but learning concepts and ideas is essential. It is far more beneficial in the long run to learn how to **identify and apply unifying principles** to the ever-changing planet around us rather than to simply recall facts. In short, understanding concepts will enable you to grasp the big picture that you can fill in with new facts and details later in life when a new environmental or energy debate arises.

Soon, you will be experiencing the excitement of using chemistry to help understand the intricacies of the world around you!!!

Expectations for Academic Integrity

The principles and penalties of the DU Honor Code and Academic Misconduct policy will be upheld. All exams are to be completed

individually. I expect that all of your work for credit will be conducted with academic integrity. Any breach of academic integrity will receive a very strict penalty. If cheating occurs on any piece of graded work, the minimum penalty will be an automatic grade of ZERO for that assignment and a report to the Office of Student Conduct. Falsification of data is a serious offense in research in any industrial or academic setting. I expect that each of you will promote academic integrity by reporting to me any breach of such, as prescribed by *Constructive Action*. *Constructive Action* is defined as reporting any action contrary to the Honor Code to someone in a position to take action – such as a faculty member, Dean, Campus Safety officer, or administrator. Failing to take such action may result in a violation of the *Non-Action* policy.

It is encouraged for students to work in groups on suggested homework problems and for exam review. However, each student is required to do his/her own share of work. Discussion is allowed regarding homework assignments, but the final submitted answer must be your own (i.e. someone else *cannot* do your homework for you, including online work). If any submitted assignment matches another student's both grades will result in a zero (recall copying online resources is academic misconduct).

Academic Integrity summary:

Exams and quizzes: Completed individually without books, notes, headphones, or notes programmed into a calculator or other electronic device.

Online homework: You are encouraged to discuss the problems with your classmates, but the answers you enter are your own. Tutors or others are not permitted to enter nor feed you the answers.

Lab Reports: Fabricating information, such as data for a lab report is a violation of the Academic Integrity Policy. Lab experiments are conducted in pairs, each student must record their data on to their

own worksheets or reports. Post lab questions must be completed individually.

Distractions

Students must respect the classroom environment. Laptops are NOT needed, nor are they suggested for use in the class. During lecture all cell phones and electronic devices shall be turned off. I reserve the right to answer any calls received in the lecture hall. Unless specifically directed by the instructor, students shall refrain from sending email and instant messages, or from engaging in other activities (facebook, watching youtube, reading non-course materials, engaging in private conversations and so on) that disrespect the classroom environment and learning conditions for others.

Make-Up Work

If you must miss a class or exam, inform me **IN ADVANCE**. The only valid excuses for missing any assignment or class are a family emergency (must be reported to Office of Health and Counseling) or valid University event (must have info from Athletics Office, etc.). Since at least one quiz, homework, and participation grade is dropped, the choice to miss a class or assignment due to illness or other unforeseen event will not gravely impact your grade, nor is it an excused event. You may reschedule your **lab** time once per term, but this must **BE DONE IN ADVANCE** and completed during the week of the lab assignment.

University Policy for Special Needs

Students with medically recognized and documented disabilities and who are in need of special accommodation have an obligation to notify the University of their needs. If you have questions concerning the services available for students with disabilities at DU (physical, psychological, learning disabilities, etc.) please contact Disability Support Services, so that your needs may be addressed. DSS is located on the 4th floor of Ruffatto Hall, 1999 E. Evans Ave. Official notification regarding disability conditions that may impair a student's academic performance must be communicated to me by DSS.

Percentage Breakdown:

Laboratory (7 at 4.5% each)	31.5%
Quizzes/In Class exercises Equally weighted Lowest one dropped	6%
Clicker and Participation Equally weighted Lowest one dropped	7.5%
Connect Online Homework Equally weighted Lowest one dropped	8%
In Class Exams (2 at 14% each)	28%
Final Exam	19%
Course Total	100%

**I reserve the right to adjust the weighting of grades.

Laboratory Reports and Worksheets

Lab work will make up 35% of your grade.

- Lab reports are due to your **TA mailbox** located in 204 Olin across from my office **EACH MONDAY BY NOON** (or to Sturm 254 between 11:50-12:05)
- Lab reports and **PRE-LABS** are due to your TA at the **BEGINNING** of each lab (after 10 minutes, assignments are considered late and will receive a grade of zero).
- Pre-lab quizzes will be administered during the first 10-15 minutes of your lab and count toward your lab grade. No additional time will be provided for late students.
- Materials for conducting each experiment will be available only during the week designated in the syllabus.
- **If no attempt is made on the post lab analysis (post lab questions, data graphing, etc), a grade of zero will be given for the lab.**

See Laboratory Information page below for further details.

Quizzes/In-Class Exercises

The quizzes will cover recent material from

both class and lab. The quizzes may be handwritten or clicker. In-class exercises may include group work or individual worksheets.

Clicker/Participation

You must register your clicker online via the blackboard website. No score will be assigned based on answers being right or wrong. To earn the points from Clicker sessions, you must answer at **least 75%** of the questions posted.

The instant feedback the clicker provides helps me determine the level of understanding of a given concept so that the teaching can be tailored to the class's needs.

Online Homework

Online homework sets will be assigned regularly using *Connect*. The homework problems will help you evaluate your understanding of the course material and provide review materials for exams.

Exams

Bring a calculator to all exams.

The dates for the three scheduled exams are:

- **Mon, Jan 27th - 12:00pm - 1:30 pm**
- **Mon, Feb 17th - 12:00pm - 1:30 pm**
- **FINAL: Fri, Mar. 14th - 12:00-1:50pm**

*note, I reserve the right to change these dates as necessary, and will notify you immediately of any modifications to the above dates.

There will be **NO makeup exams**.

Exams focus on the information covered since the beginning of the term or previous exam. However, *knowledge of chemistry is cumulative*, therefore material covered in earlier chapters will often be necessary to answer questions. The exams will include questions dealing with definitions, descriptions, and facts. They will also test your skills to explain concepts and ideas and provide quantitative analysis. Practice exams will be provided.

The final exam will cover the entire term.

Grade disputes are subject to policies of the Chemistry Department and initially must be directed to Prof. Kristensson.

Attendance/Preparation

- **NO LAPTOPS DURING LECTURE.** Sit in the back if you insist on bringing a laptop.
- Students are expected to attend *every* class, as grades are given for your Clicker response system, in class quizzes and exercises. Material provided lecture may not be in the book.
- You are responsible for obtaining all the handouts and other materials provided during the term. Check blackboard for supplementary information and notices.
- It is expected that students have **read** the material that will be covered in the lecture **prior** to class. You are responsible for all material covered in class, including activities, demonstrations, and videos available online, in labs AND in the assigned readings.
- ***Be considerate of space and sounds in the classroom.*** Out of respect to your classmates, please observe the following rules during lectures:
 - STOP WATCHING THAT VIDEO. Close your laptop or don't attend.
 - Arrive on time, seated and ready to listen when the lecture begins. If an emergency causes you to arrive late, please enter quietly.
 - Do not begin to pack up your books before the class is over
 - Do not have conversations with your neighbor during lecture
 - **Turn off** your cell phone and pager
- Be consistent, thorough, and organized in your studying.
- Use your **Clicker** during class. **Complete the online registration of your clicker by the second lecture** to receive credit for in class participation and attendance. If you have trouble registering, email me or come during office hours.
- Register on **Connect** to perform regular homework and get credit for it.
- Cell phone use of any type will not be permitted in class or during laboratories. This means you must bring a separate calculator with you for exams and quizzes. No headphone use during class or laboratories is permitted at any time.
- Classroom and any online discussions should be respectful to everyone and relevant to the topic we are discussing.
- Any disruptions in class will be addressed by the instructor according to the DU Code of Student Conduct. (See <http://www.du.edu/studentlife/ccs/policies> for more information about the conduct system.)

Important Registrar Deadlines: Last day to drop without record: Sun Jan. 12th. Last day to drop without approval via WebCentral: (W grade) Feb. 16th. Last day to drop with approval: Feb 26th.

Labs are conducted in 15 Boettcher West. There are seven labs scheduled for 2 hr 50 min.

One goal of lab is for you to **begin asking questions about the information prior to conducting the experiment**. Along these lines, you may be required to design and conduct experiments to answer your questions.

The lab will consist of

- 1) Pre-lab quiz (first 10-15 minutes)
- 2) In-lab work and data collection
- 3) Post-lab report and calculations. This varies depending on the lab, but may include a writing component. **Without completion of post-lab component, a zero will be given for lab completion (data).**

Two missed labs will result in a failing grade.

You will be working with a lab partner unless otherwise notified. Experimental work will be done in **pairs**, with each member **participating equally** in the lab manipulations, data analysis, and questions. Data will be shared between you and your partner; however, **each student must complete their own assignments**. You may/should discuss pre-lab, in-lab, and post-lab work with your partner. **Include your partner's name on all lab assignments.**

Prior to your lab section, you must complete your pre-lab questions on a SEPARATE sheet of paper. ***You will not be granted access to the lab without having completed and handed this in.***

You will need to search online to obtain MSDS.
MSDS Resource: <http://www.sigmaaldrich.com>
MSDS: No print outs of MSDS material will be accepted. You are required to obtain the "Hazards Identification" information assigned and WRITE OUT the information for your pre-lab. **This information must be completed prior to entering the lab**

Budget approximately an hour each for pre- and post-laboratory assignments. Some weeks may require a bit less time, and others a bit more. Familiarizing yourself ahead with each week's procedures by reading the assigned experiment and any supplementary information provided by the instructors will help you maximize your

efficiency (and quiz score!). All experiments must be completed during their **assigned** lab period.

Lab reports are due the MONDAY after you have completed the lab. No late lab reports will be accepted. A tentative schedule of laboratory classes is given at the end of this syllabus.

You must make every effort to attend every laboratory session. Do not be late to lab class as there is a strict limit on the amount of time available to perform the activity. If you arrive late you will not be given extra time to complete the assignment or quiz. If you are late you may be told you cannot commence the experiment. **There will be no makeup laboratory sessions.**

TA's initials are required prior to conducting the lab to show completion of pre-lab AND after the lab prior to leaving.

LAB Safety

There is an element of hazard in every laboratory course. Safety will be covered as part of the first lab period.

You are REQUIRED to wear approved safety goggles while in the lab.

Clothing requirements:

- Shoes must cover entire foot (no crocs)
- No bare legs
- No loose or baggy clothing
- Long hair must be tied back
- Goggles must be worn at all times.

If you are inappropriately dressed, you will not be permitted to attend the lab session for your own safety and the safety of others around you.

Pagers, cell phones, music players, and headphones of any kind may not to be used in the lab.

Food and drink are prohibited in the lab

Label all containers; unknown contents creates danger

Dispose of all wastes properly! If you are unsure of how to dispose of your wastes, ask your TA.

Leave no trace. Clean up after yourself! Wipe up all spills. Dispose of all trash. Wash all glassware. Ensure safety for everyone.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT.
Jan 5	6 First Lecture	7 Labs Begin Jan 13	8	9	10	11
12	13 Lab 1: Evap. And Molecular Properties and Radon Detection Setup				17	18
19	20 MLK HOLIDAY	21	22	23	24	25
NO LAB RADON Info DUE via email to GTA						
26	27	28	29	30	31	Feb 1
Lab 2: Making Biodiesel						
2	3	4	5	6	7	8
Lab 3: Comparing Energy Content of Fuels						
9	10	11	12	13	14	15
Lab 4: Electricity from Chemical Reactions						
16	17	18	19	20	21	22
Lab 5: Solar and Fuel Cells						
23	24	25	26	27	28	Mar 1
Lab 6: Insulation Design						
2	3	4	5	6	7	8
Lab 7: Radon Detection and Microscopy						
9	10	11	12	13	14	15

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT.
Jan 5	6 Course Outline, Syllabus, Scientific Method, Intro to Energy. 4.1. 4.2. 4.5	7	8	9 4.4 , 10.2 Coal vs Oil, The Distillation Tower: Intermolecular Forces	10	11
12	13 4.4, 4.7 Fossil Fuels: Distillation Towers, Cracking, coke and crude	14	15	16 4.5, 4.6, 4.8 Why does burning fuels produce energy? Energy diagrams	17	18
19	20 MLK HOLIDAY NO LECTURE	21 Lecture canceled	22	23 4.9, 4.10 Biofuels and functional groups.	24	25
26	27 FIRST EXAM		28	29 8.1, 8.2 How batteries provide energy. WS on Redox	30	31 Feb 1
2	3 8.4 Redox cont. and How Hybrids Work	4	5	6 8.5, 8.6 Fuel Cells and Hydrogen Cars	7	8
9	10 8.7 Solar Cells.	11	12	13 8.8 Wind, Geothermal, Water where they work and why	14	15
16	17 SECOND EXAM		18	19 7.1, 7.3, Nuclear Power. Not in my backyard?	20	21 22
23	24 7.2, 7.4 Radioactive Isotopes and Decav	25	26 Last day to drop	27 7.6 Radiation dose and you.	28	29 Mar 1
2	3 7.8, 7.9 Here today and here tomorrow. Half Life and Nuclear waste	4	5	6 7.5, 7.7, 7.10, 7.11 Weapons, Meltdown and Energy needs	7	8
9	10 Last Day of Lecture	11	12	13 Final -02	14 Final -01	15