

Course Instructor:	Dr. Joseph Houck, Office: Whitmore 220B Tel: 814-865-0106, e-mail: jdhouck@psu.edu
Office Hours:	See ELMS/Canvas for up-to-date times; you can always email me for an appointment!
Teaching Assistant:	Zachary Rhoden, zcr5008@psu.edu
Required Materials:	<ul style="list-style-type: none">- <i>PSU-E Chem 110: Structure and Properties</i> (eBook, access codes available only through PSU Bookstore, ordering info here: http://sites.psu.edu/chem110wc/course-materials/ [a printed copy is available for purchase at the bookstore, but it does not include required in-text problems and interactive figures.]- Scientific calculator (non-programmable)- Video recording capabilities such as a smartphone or webcam- Photo or scanning capabilities
Important Dates:	August 26 is the last day to adjust your schedule. November 10 is the last day to drop the course with a "W". Dates available at: http://registrar.psu.edu/academic_calendar/fall17.cfm
Note:	This course will require you to take exams using certain proctoring software that uses your computer's webcam or other technology to monitor and/or record your activity during exams. The proctoring software may be listening to you, monitoring your computer screen, and viewing you and your surroundings. By enrolling in this course, you consent to the use of the proctoring software, including but not limited to any audio and/or visual monitoring which may be recorded during the exam.

COURSE OBJECTIVES

The purpose of this course is to provide you with an introduction to atomic and molecular structure as well as molecular properties. We will also discuss general principles of reactions including stoichiometry and some thermodynamics. The long-term goal of this course is to get you to begin thinking of chemistry in your everyday life. You should begin noticing that chemistry is everywhere: it is in the foods we eat, the ingredients in our soaps, and the reason flowers and leaves have specific colors. I encourage you to send me anything that you find interesting about chemistry including videos, pictures, or websites.

Course Goals:

- Learn the language and basic tools of chemistry; gain general knowledge.
- Connect nanoscopic properties to macroscopic properties (structure affects function).
- Emphasize the role of energy in chemical and physical processes.
- Develop critical thinking and analytical problem solving skills.
- Increase student confidence in problem solving abilities.
- Incorporate graphical methods for interpreting and presenting data.
- Appreciate the value of chemistry in everyday life.

Learning Objectives:

At the end of the course, students will be able to...

- Define key terms and concepts in chemistry.
- Explain how atomic and molecular structure relates to macroscopic (observable) properties of matter.
- Define the various forms of energy, explain how energy interacts with matter, and be able to calculate the energy changes associated with chemical and physical processes.
- Apply chemistry concepts to solve mathematical problems on homework, problem sets, and exams.
- Describe the chemistry behind phenomena in everyday life (i.e. why water is a liquid).

GRADING IN THE COURSE

The final grade is calculated based on scores in each assignment category (details follow).

Skills Check	15 points
Midterm Exams (100 points each)	400 points
Final Exam	200 points
Weekly HW Sets (15)	60 points
Participation	100 points
Total	775 points

Letter grades are determined based on overall percent grade. The exact percentage cutoffs for each letter grade will be decided at the end of the semester. A typical cutoff distribution is as follows:

Grade	F	D	C	C+	B-	B	B+	A-	A
Percentage	0	57	69	77	80	84	87	90	93

Using these cutoffs, a student whose overall percent grade is above 84 and below 87 would earn a B.

Skills Check (~2%)

The skills check is an opportunity to review topics from high school chemistry that will be used in CHEM 110. There are two parts to each of the five topics, aptly named “Part A” and “Part B.” Each part is a quiz with 5-7 questions and a 20-minute time limit. In Part A, you may take the quiz as many times as you like. Once you are confident in the skill, you can take Part B up to three times. Only the highest score in each part will be recorded. (Everyone can earn 100%!!!!) Your average percent score on **all 10 quizzes** (5 skills, two parts each) will be your grade on the skills check. For example, if you earn an 80%, you would earn 12 of 15 points.

Midterm Exams (~13% each)

There will be four (4) 50-minute midterm exams given over the course of the semester. Exams will focus on material covered since the last exam; however, you are still responsible for information presented previously. If you read your lecture notes & the eBook and solve the recommended problems, you will be able to anticipate the exam questions; all concepts could make multiple appearances. The exams will consist of short answer questions and open-ended problems. Some questions may be multiple choice. Stay tuned to announcements on the format.

- You are required to have an approved ID card for each exam.
- *Only a non-programmable scientific calculator may be used.* Cell phones may not be used and must be silenced and put away during exams.

In this class you will take your tests remotely and they will be proctored by a service called Examity®. Review the Student Quick-Guide, which is available on ELMS/Canvas, for instructions on how to use Examity®. Please log in as soon as possible to set up your profile. You will not be able to schedule exams until your profile is complete. **Exams must be scheduled at least 24 hours in advance to avoid late fees.**

Examity® system requirements are:

- Desktop computer or laptop (not tablet)
- Webcam and microphone (built-in or external)—test your webcam at www.testmycam.com
- Connection to network with sufficient internet speed: at least 2 Mbps download speed and 2 Mbps upload—test internet speed at www.speedtest.net
- Operating systems: Windows XP–Windows 10, Mac OS X 10.8 (Mountain Lion)–10.11 (El Capitan)
- Browser with pop-up blocker disabled: Google Chrome v39 or later, Mozilla Firefox v34 or later, Internet Explorer v8 or later, Microsoft Edge, Apple Safari v6 or later

If you have any questions or concerns, contact Examity's technical support team 24/7 via email at support@examity.com or phone at (855) 392-6489.

Grading of the exams will be completed within 1-2 days and will be handled by a team of graders led by Dr. Houck.

Final Examination (~26%)

A cumulative final exam will be given during the week of December 11. The exam window will be announced later in the semester. The final exam will be proctored remotely just as the midterm exams.

Homework Sets (~8%)

There will be 15 graded homework sets (4 points each) throughout the semester. One assignment will be due every week. On most occasions homework will be graded solely based on completion and effort. On several randomly selected occasions, however, one randomly selected problem from the homework assignment will be graded for 2 points based on correctness. On those occasions, completing the rest of the homework assignment is worth an additional 2 points, graded based on completeness and effort. Homework sets will be available on Canvas and are due by submitting a file in the Canvas assignment each Tuesday by 11:59 pm. **There will be no late homework accepted.** The lowest homework score will be dropped at the end of the term.

Other assignments, such as an eBook Scavenger Hunt (7 points on Canvas) will be included in this category. If you earn 85% or more of the available homework points, you will earn all 60 points in the category! If you earn fewer than 85% of the possible points, you will receive a proportionally lower score. No extra credit results from accumulating a score of more than 85% of the points.

Participation (13%)

Participation in class will come in three forms: attending a weekly recitation, answering the guiding questions, and interactions in ELMS/Piazza. More information on each type of participation is described below.

Weekly Recitation: Recitations are one-hour sessions led by a pair of learning assistants via Zoom video-conferencing. Recitation is an opportunity to participate actively in problem solving and to ask questions about the material. Students will be assigned a recitation session according to their availability as indicated by a “When is Good” poll (sent to students via email prior to the start of classes). There will be 5-7 students in each recitation session. To be prepared for recitation, you should bring a copy of the recitation worksheet (available on ELMS), a copy of the Periodic Table and datasheet, and a scientific calculator. There will be 14 recitations (they will begin in week 2). If you attend 12 of the 14 sessions, you will earn

all **30 points**. Each absence beyond the first two will result in a three-point (10%) reduction of your recitation grade.

Guiding Questions: Each week, there will be 2-3 “Guiding Question Sets” meant to assess your comprehension of the course content (reading and/or videos). These will be available in Canvas (also linked in ELMS) and due each Friday at 11:59 pm. If you earn an 85% or higher on the guiding question sets, you will receive all **40 points** available in the category. If you earn fewer than 85% of the possible points, you will receive a proportionally lower score. No extra credit results from accumulating a score of more than 85% of the points.

Interactions: Interactions include watching videos, answering embedded h5p questions in ELMS, and posting questions or answers to Piazza. Behind-the-scenes click data for users can be tracked and will be counted for this portion of the participation grade. We will use Piazza as a class forum/chatroom for asking and answering questions about the course. You can ask and answer questions here, which will be monitored by the TAs, LAs, and instructor. Please direct your questions here before e-mailing. You will be able to ask and answer anonymously if you wish. The beauty of Piazza is that the entire class can benefit from the questions and answers. More information on enrolling and etiquette for using will be provided during the semester. Any personal inquiries can be addressed by email (see below). If you interact with at least 85% of the course content in ELMS and make a minimum of five (5) posts to Piazza, you will earn all **30 points** in the category. If you interact with less than 85% of the content, you will receive a proportionally lower score.

Extra credit (~1%)

There will be several opportunities to earn up to a maximum of 8 extra credit points over the course of the semester. Opportunities will be announced as they come up. The number and type of assignment are at the discretion of the instructor.

Borderline grades

As an inducement to encourage students to work the weekly “Knowledge Checks”, the following mechanism has been devised to handle borderline grades. There will be 15 Knowledge Checks released over the term on Canvas. Students who **complete the knowledge checks with an average score of >80% AND are within eight (8) points of a letter grade cutoff** following final grade calculation will have their grade boosted to the next level. The deadline for completing each quiz is Sundays at 11:59 pm. (Specific due dates for KCs are indicated in ELMS/Canvas.)

Deferred grades

Deferred grades are granted only in special circumstances when, for reasons beyond a student's control, a student is prevented from completing a course within the prescribed time. It is the student's obligation to request a deferred grade, and to take a comprehensive final exam before the University-set deadlines.

COMMUNICATION

ELMS

Most of the course materials and content will be housed in the ELMS Learning Network, a next-generation platform for hosting course content. Here, you will find course information and resources such as videos, interactive questions, problem sets, etc. Links within ELMS will take you to Canvas for assessments (more below).

Canvas

We will be using Canvas as the course management resource for assessments (guiding question sets, knowledge checks, homework submission, exams) and monitoring grades. If you are not familiar with

Canvas, go to and log in using your directory ID (this is the same as your email username and password). After logging in, click on CHEM 110 World Campus to enter the site. You can monitor your grades and find a link to ELMS [here](#).

Email (I strongly prefer an email rather than a Canvas message.)

I will often email announcements to the class. It is important that you receive these emails. The course listserv will be created on the first day of class and a test message will be sent out. If you do not receive this email you need to contact me ASAP.

I infrequently check my email after 8 PM and on weekends. If you email me during these times, I will most likely reply the following day or at the beginning of the week. If you do not hear from me within 48 hours (except weekends) you should probably follow up with another message. ****Remember to post content questions to Piazza first!**

While the University does not have rules and regulations for contacting faculty by email, I have a few rules of etiquette that students need to follow if they expect to receive a response: 1) there should be a salutation, e.g. Dear Dr. Houck 2) Please explain your situation using complete sentences. I do not text you and expect that you do not text me 3) Please give your **full name and course** at the end of the email. A sample acceptable email is shown below:

Dr. Houck,

I did not receive your "test" email. Could you please add me to the course listserv?

John Smith

CHEM 110

POLICIES OF NOTE

Regrades & Grade Corrections

If after an exam is returned there is a question concerning the grading of the exam, the exam should be returned to Dr. Houck for full reconsideration. Under no circumstances will anyone else make changes to the grade of an exam. All requests for re-grading are to be made in writing according to the procedure outlined below and must be submitted to Dr. Houck by the announced due date. **Note that the entire exam will be re-graded and this may result in a lower grade.** Late re-grades will not be accepted and will not be considered at the end of the semester. Re-grades can be picked up from Dr. Houck's office one week after turning in.

The written request for a re-grade must be **on a separate piece of paper. DO NOT WRITE ON YOUR EXAM.** The re-grade must include: 1) the correct answer for the question (copied from the posted key) 2) the answer that you gave for the question (copied by hand from the exam) 3) an explanation as to why you feel the problem should be re-graded 4) staple the re-grade paper to the front of your exam.

Note: Addition errors made during point totaling are not considered re-grades and may be given to the instructor for correction at any time during the semester. I will not discuss with you whether or not you should submit a re-grade. "Brief comparisons" (item #3 above) which consist of "I think I deserve more points" or "the answer is correct because my friend had the same answer" are NOT reconsidered.

Examity Fees for Cancellation and Re-scheduling

Within the Examity fee structure there are two instances that can result in a \$3.00 on-demand charge to the institution or the student. The first is if a student cancels a scheduled exam within 24 hours of the exam date and time, and the second is if a student schedules or reschedules an exam within 24 hours of the exam date and time.

To better understand these fees we have defined Cancelled Exam, Scheduled Exam, and Rescheduled exam below:

Cancelled Exam – An exam is considered cancelled if the student cancels the exam and does not take any additional action to reschedule.

Scheduled Exam – This is any exam that the student schedules that does not currently show up as a scheduled exam.

Rescheduled Exam – If a student needs to change the date or time of an exam then this is considered a rescheduled exam and not a cancellation.

No-Show – If a student schedules an exam and then does not show up to take the exam this is classified as a no-show and the normal exam costs will be charged (please see the Examity web site for costs associated with proctored exams).

The on-demand fees associated with cancelled exams, scheduled exams, and rescheduled exams are determined per the following scenarios.

1. If a student cancels less than 24 hours in advance, the University is charged a \$3 fee. (There are no fees associated with cancellations more than 24 hours in advance.)
2. If the student schedules or reschedules less than 24 hours in advance, the student will incur a \$3.00 fee that can be paid by credit card (Visa, MC, AMX, Prepaid credit card). If the student does not have a credit card, they should contact their instructor to request the test window be extended for them so that they can reschedule or schedule more than 24 hours in advance to avoid on-demand fees.

Student Disability Resources (SDR)

Penn State welcomes students with disabilities into the University's educational programs. *If you have academic accommodations, please see me in my office for testing arrangements ASAP.* For further information, please contact Student Disability Resources at <http://equity.psu.edu/student-disability-resources/disability-coordinator> Their educational counselors can help with time management, reading, math learning skills, note-taking and exam preparation skills. All their services are *free* to PSU students.

In order to receive consideration for reasonable accommodations, you must contact SDR, participate in an intake interview, and provide documentation: <http://equity.psu.edu/sdr/guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

Counseling and Psychological Services (CAPS)

Mental health services are available to help you maintain your academic success. Please visit the student website (<http://student.worldcampus.psu.edu/student-services/mental-health-services>) to learn more or to speak with a mental health advocate who can help you address concerns including anxiety, depression, relationship difficulties, and stress. If you or someone you know is experiencing a crisis situation, please call your local emergency service.

Educational Equity/Report Bias

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via <http://equity.psu.edu/reportbias/>

Honor Code Issues and Academic Integrity

You are reminded of the Academic Integrity Policy in the University Code of Conduct: “Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.

Academic integrity includes a commitment by all members of the University community *not to engage in or tolerate acts of falsification, misrepresentation or deception*. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.”

For more information on Academic Integrity, please see the Undergraduate Advising Handbook:
<https://handbook.psu.edu/content/academic-integrity>

All Penn State (<http://www.psu.edu/dept/oue/aappm/G-9.html>) and Eberly College of Science (<http://www.science.psu.edu/academic/integrity/>) academic integrity policies and procedures regarding ethics and honorable behavior apply to this course. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabrication of information or citations, facilitating acts of academic dishonesty by others, having unauthorized possession of examinations or other unauthorized class materials, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. In a broader context, you should be familiar with and follow the Penn State Code of Conduct and the Code of Mutual Respect and Cooperation.

Specific instances of academic dishonesty in this course include, but are not limited to:

- Representing yourself to be another person online
- Allowing another person to represent you online
- Allowing unauthorized persons to access lecture materials, quizzes, or exams
- Copying or helping someone else copy during an examination
- Receiving help or information from any person during a quiz or exam
- Using unauthorized materials or notes during quizzes or examinations
- Searching for quiz or test answers on the internet ("googling" the answers)
- Using a text-programmable calculator on quizzes or examinations
- Using a cell phone or other communication device during a quiz or exam
- Stealing or destroying course materials
- Sharing information about quiz and exam questions with other students
- Altering answers or grades on graded examinations
- Having notes or extra papers of any kind out during an exam
- Having someone take an examination for you
- Distributing course materials to others
- Providing a false excuse for missed exams
- Attempting to do any of the above

Consequences of such infractions may range from awarding a grade of “0” on the exam or assignment in question to receiving an immediate F in the course and not allowing the student to drop the class.

Week	Date	Topic/Assessments	Readings (eBook)
1	08/21-08/27	Course Overview Introduction to atomic structure The mole, ions & molecules Introduction to energy	01-1, 01-2 01-3 01-4, 01-5
2	08/28-09/03	Light and Spectroscopy Line Spectra & Bohr Model Quantum numbers and orbitals Skills Check Due by 11:59 pm 09/03	01-6 02-1, 02-2, 02-3 02-4, 02-5
3	09/04-09/10	Electron configuration Periodic properties	Chapter 03 Chapter 04
	09/13-09/16	EXAM 1 (Ch. 1-4) (schedule your 50-minute exam with Examity)	
4	09/11-09/16	Intro to Molecules Molecular formulas and % composition	05-1 05-2
5	09/18-09/24	Ionic compounds Covalent Compounds & Bond polarity Lewis Structures & Formal charge	06-1, 6-2, 6-3 06-4, 06-5, 06-6; 07-1, 2 07-3
6	09/25-10/01	Resonance Exceptions to the octet rule Electron domain geometry	07-4 07-5 08-1, 08-2
7	10/02-10/06	Molecular geometry & Polarity Hybridization Pi bonding	08-3, 08-4 09-1, 09-2 09-3
	10/11-10/14	EXAM 2 (Ch. 5-9) (schedule your 50-minute exam with Examity)	
8	10/09-10/15	Organic Molecules Functional Groups & IM Forces	10-1, 10-2 10-3, 11-1, 11-2, 11-3, 11-4
9	10/16-10/22	IM Forces & Phase Changes Heating Curves Vapor Pressure, Phase diagrams, Liquid Properties	11-5, 13-1 13-2 13-3, 13-4, 13-5
10	10/23-10/29	Solution Process Electrolytes Solubility (of solids and liquids)	14-1 14-2 14-4
		EXAM 3 (Ch. 10, 11, 13, 14-1, 14-2, 14-4) (schedule your 50-minute exam with Examity)	
11	10/30-11/05	Concentration KMT, Gas Laws	14-3 12-1 (skip 12-2), 12-3
12	11/06-11/12	Ideal Gases Real gases, solubility of gases Chemical reactions, ionic equations	12-4 12-5, 12-6, 14-4 15-1, 15-2
13	11/13-11/19	Classes of reactions, oxidation number Stoichiometry, limiting reactant, percent yield Reaction calculations, combustion analysis	15-2, 15-3 15-4, 15-5 15-5
	11/20-11/24	<i>Thanksgiving Break</i>	
	11/29-12/02	EXAM 4 (Ch. 12, 14.3, 15) (schedule your 50-minute exam with Examity)	
14	11/27-12/03	Reaction enthalpies Calorimetry	16-1 16-2
15	12/04-12/08	Hess's Law & Heats of formation Bond dissociation energies	16-3, 16-4 16-5
16	TBA	Final Exam (1 hour 50 minutes)	

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