

SYLLABUS CHEM-111 General Chemistry I

CONTACT INFORMATION.

Instructor: Dr. Jeff Osborne

Email: jposborne@manchester.edu - Be sure to put "CHEM-111 insert subject here" in the Subject line of any course-related email to me.

Contact Policy: I will respond to your questions or course related difficulties within a reasonable amount of time (usually 24 hours).

Office Hours: 313 SciC. I maintain open office hours (an open door means I am available). The schedule next to my door will show you specific times when I am in my office. You may also make appointments.

COURSE MATERIALS.

Textbook. Chemistry, 7th ed., by McMurry, Fay, and Robinson, ISBN 9780321943170

Homework Problems. Sapling Learning. Enroll at <http://bit.ly/saplinginstructions>. During sign up or throughout the term, if you have any technical problems or grading issues with Sapling, send an email to support@saplinglearning.com explaining the issue. Note that Sapling Learning offers a grace period on payment that, for most courses, is 14 days from the first day of the term.

Calculator. Bring one to each class period and lab. Cell phones are unacceptable calculators for exams or quizzes.

3×5 Index Cards. Bring your own 3×5 index cards for Daily Responses or short writings. Note that 3×5 index cards are *free* outside Room 209 in the Success Center in the Student Union.

COURSE OBJECTIVES. This course is a partial fulfillment of the Manchester University Core criteria for Ways of Knowing – The Natural World (C4-Nx). The goals of C4-Nx courses are to:

1. "demonstrate a systematic understanding of some aspect of the natural world through learning the content, vocabulary, and interrelationships among well-supported scientific theories."
2. "articulate the unique features of scientific methodologies, such as hypothesis testing based on empirical observations, and probabilistic conclusions."

You will be acquiring a systematic understanding of the foundations of chemistry, which will involve examining some of the (often surprising!) experimental results and how they led to the scientific hypotheses, theories and laws that comprise this foundation. Material from this class will be expanded on in every other chemistry course you will ever take and can be divided into four units:

1. Chapters 1-4 "*The Chemist's Toolbox*": What basic skills and concepts are common to chemists, and how do these? How are these fundamentals used to qualitatively and quantitatively describe chemical reactions?
2. Chapters 6-7. *Atomic Structure*: What is the structure of an atom? How does atomic structure lead to our ability to understand and predict the properties of chemical elements?
3. Chapters 8, 9, 21. *Bonding and Molecular Shape*: What is a chemical bond? How do chemical bonds form? How do the bonds determine molecular shape and function?

4. Chapters 10, 11, 12. *Intermolecular Interactions*: How do molecules interact with one another? How do these interactions explain their behavior in the liquid and gaseous phases?

TEACHING METHODS. Class sessions will be mostly lecture with a few guided inquiry activities worked on in small groups. I will create stimulating opportunities for your learning in a number of ways, providing and requiring many forms of feedback daily. I bring expertise in the subject area, yet require you to wrestle with the ideas presented so that you are able to arrive ultimately at your own conclusions. I enthusiastically welcome ideas and suggestions, with the goal of improving the course. I strive to practice what I preach as a scientist who is continually learning.

EXPECTATIONS OF STUDENTS. The content of the course will be covered during class time and you will be responsible for everything that is covered. The textbooks are resources, but do not determine nor contain the full content of the course. Each class meeting will be important and will build on knowledge learned in previous meetings. Notify me in advance if you cannot attend a class. Missed quizzes or exams cannot be made up except under very special, documented conditions described below under the heading "Makeup Exams and Quizzes" in Course Policies. I can help you learn, but the responsibility is yours.

“How can I do well in this course?”

- Attend class.
- Read before class. Then, go through your notes after class while re-reading the same material.
- Do ALL of the assigned homework problems, plus more. In fact, try them multiple times, or do other similar problems in this text or other texts. **Understanding the homework is integral to understanding exam questions.**
- Figure out what you don't know, and then learn it.
- Seek help early, and as often as you need it.
- Form study groups with your peers and meet often to discuss material and do problems. You will understand and retain material better if you have to explain it to someone else.
- Your older classmates are a huge asset. Chemistry study table leaders can help you. They have been chosen by the chemistry professors because they are successful in chemistry.
- You MUST know algebra and have a strong understanding of how to apply it to solving story problems. Our math review on the first day of lab will give you an idea of the required skills. If you feel unsure about **any** of these concepts, please see me as soon as possible!

COURSE WEB SITE. <https://canvas.manchester.edu> - The Canvas course page will contain online quizzes, homework problems, grades, supplementary reading, and other useful materials. Assignment scores are entered when they are graded, enabling you to see a running total of your points. It is your responsibility to let me know if an assignment grade is missing or incorrect on Canvas by bringing it to me.

ASSIGNMENTS. Out-of-class work is the most important way for you to engage with class material and to learn and retain that material. Reading Quizzes prepare you for class, Daily Responses give you a chance to reflect on class material, and Homework Sets help you master

the concepts and problem-solving skills necessary for success in chemistry. In-Class Quizzes help identify areas of poor understanding. Exams assess mastery of material.

Before coming to class: Reading Quizzes – Before attending class, I expect you to complete the class session's required reading (see schedule) and complete a short reading quiz on Canvas. All reading quizzes are open as soon as they are written, but close when that lecture begins. You have two 10-minute attempts to complete the quiz, the average of which will be your final score. You may use your book, but please do not use any other resources. Even if you cannot attend class, you must complete the reading quiz on time.

33 reading quizzes @ 3 pts/each = 99 pts

During class: In-Class Quizzes – Listed on the class schedule. **4 in-class quizzes @ 10 pts/each + 1 at 25 pts = 65 pts**

In-Class Activities – Given at several times over the course of the semester, each with a short assignment. Due dates will be announced as these activities are introduced in class.

4 in-class assignments @ 5 pts/each = 20 pts

As a response to class: Daily Responses – At the end of each day's lecture, turn in a 3×5 note card with your name, the date, and (optional) any question you have from the day's lecture. Bring your own note cards; they are available for free at the Success Center. **33 daily responses @ 1 pt/each = 33 pts**

After class: Homework Sets – You will complete frequent graded homework sets this semester (see the course schedule for due dates) using the Sapling Learning site for our course. You have unlimited attempts to answer each question correctly, although each subsequent attempt will reduce 5% from the grade for that question. Significant figures are not used, but answers generally need to be within 2% of the correct answer. **10 full homework sets @ 10 pts/each = 100 pts**

Exams: Four semester exams (100 pts/each) will be given. Makeup exams require prior notice and proper documentation. Please plan accordingly. At the end of this course, you will take a Final Exam, which is a cumulative ACS standardized exam that will be scaled to 100 pts. **5 exams @ 100 pts/each = 500 pts**

GRADING. The total points for the course are tentative, as additional assignments may be added during the semester. If there is ever a discrepancy between the points recorded on Canvas and the points you earned on an assignment, bring the assignment in question to me.

Reading Quizzes	33 @ 3 pts	99
In Class Quizzes	4 @ 10 pts + 1 @ 25 pts	65
In Class Activities	4 @ 5 pts	20
Daily Responses	33 @ 1 pt	33
Homework Sets	9 @ 10 pts	100
<u>Exams</u>	<u>5 @ 100 pts</u>	<u>500</u>
TOTAL		817

A	93%	4.0
A-	90%	3.7
B+	87%	3.3
B	83%	3.0
B-	80%	2.7
C+	77%	2.3
C	73%	2.0
C-	70%	1.7
D+	67%	1.3
D	63%	1.0
D-	60%	0.7
F	<60%	0.0

A rough guide to what work earns which letter grade:

“C” - Understanding the solution to every assigned homework problem and most of the concepts very well by test day.

“B” - The ability to do a large majority of problems and understanding the solution to every problem, assigned or not, and understanding the concepts.

“A” - Being able to do nearly every problem, assigned or not, and

understanding the relationships between concepts.

Note that increased effort typically leads to a given person earning a higher grade, but grades are based on results, not effort.

COURSE POLICIES.

Classroom Policies and Etiquette. Proper classroom etiquette is required. Please fill in the front rows of the class. All students are expected to participate in class activities. The use of cell phones is not allowed without explicit permission from the instructor. If it is necessary to have a device with you in the classroom, please make sure notifications are set to “silent”.

Makeup Exams or Quizzes. Makeup exams and quizzes will only be given for students who missed them due to verifiable illness, religious holiday, serious family emergency, jury duty or court subpoena. **Missing an exam or quiz without an excuse from the college nurse, a doctor, or Student Development is not permitted.**

Academic Dishonesty. Your academic integrity is assumed unless you demonstrate otherwise. You are expected to comply with the College’s “Plagiarism and Academic Dishonesty” policy, which can be found in the college catalog. Cheating and plagiarism are unacceptable. Some examples of cheating include but are not limited to looking at notes or a classmate’s paper during an exam or quiz, copying someone else’s homework or lab report, or taking credit for work that is not your own. The “Academic Dishonesty and Grievance” document on Canvas has more details. **Cheating will result in an “F” for the course.**

Changes to the Syllabus. I reserve the right to make changes in the syllabus when necessary to meet the learning objectives or to compensate for cancelled classes. Any changes will be announced in class and posted online.

Student Disability and Reasonable Accommodation Statement. Manchester University, in compliance with federal guidelines, is committed to assuring students with disabilities equal access to programs and activities that are provided to students without disabilities.

Any student who feels she or he may need an accommodation based on the impact of a disability should contact Audrey Hampshire, the Director of Academic Support and Disability Services, to establish eligibility and to coordinate reasonable accommodations. It is the student’s responsibility to self-disclose the disability. Students whose accommodation requests are approved will be provided with confidential letters to deliver to their professors which verify the nature of the student’s disability and document the need for auxiliary aids and services and/or academic adjustments/accommodations. Students are encouraged to meet with each professor early in the semester to discuss the academic implications of the disability as they relate to the specific course and to request appropriate accommodations. The Disability Support Services Office is located in the Success Center (second floor of the Switzer Center). Students may call (260) 982-5036 or (260) 982-5888 to schedule an appointment.

Medical Emergency Evacuation Schedule. Students should speak to the instructor immediately if (1) they may require medical attention during class, or (2) they have a disability, chronic condition, or a temporary injury that may limit or affect their ability to evacuate the classroom/building in an emergency. The student and the instructor should discuss the student’s specific needs and the types of precautions that should be made in advance of such an event. In the event of a fire or other situation requiring

emergency evacuation, students with ambulatory disabilities are to go with or without assistance to the nearest stairwell area. Faculty and staff will assist with evacuation management efforts until such time as the Campus Safety and/or Police and Fire Departments arrive on the scene to assist in student evacuation from the building. Elevators are not to be used for evacuation by any persons.

Students who need special arrangements in the event of an evacuation should also register with Audrey Hampshire as early as possible in the semester to help facilitate the provision of needed emergency assistance.

Diversity. Disrespect of other students in the form of verbal or written threats, attacks, or insults on the basis of gender, race, physical disability, physical stature, culture, socio-economic class, creed, sexual preference, mental disability or any form of social group membership will not be tolerated.

Title IX reporting requirements. While students should feel comfortable approaching the professor with issues they may be struggling with or concerns they may be having, students should be aware that faculty members have some reporting requirements that are part of their job duties at Manchester University.

For example, if a student informs a faculty member of an issue of sexual harassment, sexual assault, or discrimination, the faculty member will keep the information as private as possible, but the faculty member is required to bring it to the attention of the institution's Title IX Coordinator (x. 5052 ajmachielson@manchester.edu) or the Human Resources office (ext. 5038). Additionally, students can report incidents or complaints to Campus Safety (ext. 5999 or in Fort Wayne: 260-266-1800). Students can also obtain support from the University Counseling Services (260-982-5306).

Finally, students should know that if, for some reason, the interaction between a student and faculty member involves a disruptive behavior or potential violation of policy, the faculty member will inform the appropriate student experience staff, even when the student and faculty member may have reached an informal resolution to the incident. The purpose of this is to keep University leaders apprised of any behaviors and what was done to resolve them.

Campus resources.

Health Services

260-982-5306

<http://www.manchester.edu/OSD/Health/Index.htm>

Counseling Center

260-982-5306

<http://www.manchester.edu/OSD/Counseling/Index.htm>

Safety

NM: 260-982-5999; FW: 260-266-1800

<http://www.manchester.edu/OSD/Security/index.shtml>

CLASS SCHEDULE

Date	Topic	Reading	Reading Quiz	Other
31 Aug (W)	Atoms, Periodic Table	2.1-2.8		
2 Sep (F)	Bonding, Nomenclature	2.10-2.12	1, 2	
5 Sep (M)	Moles, Molecular Mass, Chemical Equations	2.9, 3.1-3.3	3	
7 Sep (W)	Percent Composition, Empirical Formula	3.6-3.8	4	HW 1
9 Sep (F)	Stoichiometry, Reaction Yield, Limiting Reactant	3.3-3.5	5	Quiz 1
12 Sep (M)	Solutions	4.1-4.3	6	
14 Sep (W)	Types of Chemical Reactions	4.4-4.8	7	
16 Sep (F)	Coulombic Potential	Canvas	8	HW 2
19 Sep (M)	Exam 1: Atoms to Types of Chemical Rxns			
21 Sep (W)	Light, Energy, Atomic Line Spectra	5.1-5.3	9	
23 Sep (F)	Wave-Particle Duality, Bohr Model of Atom	5.4-5.5	10	
26 Sep (M)	Quantum Mechanical Model of Atom	5.6-5.8	11	
28 Sep (W)	Electron Configurations, <i>Aufbau</i> Principle, Electron Configurations	5.9-5.13	12	HW 3
30 Sep (F)	Valence Electrons, Ionization Energy (PES)	Canvas	13	Quiz 2
3 Oct (M)	Effective Nuclear Charge	5.14, 6.2	14	
5 Oct (W)	Ions, Periodic Trends	6.1, 6.3-6.5	15	
7 Oct (F)	Introduction to Bonding, Types of Solids	6.6-6.8, 7.4-7.5, 11.4, 23.3	16	HW 4
10 Oct (M)	Exam 2: Coulombic Potential to Periodic Trends			
12 Oct (W)	Covalent Bonding: Lewis Structures Part 1	7.1, 7.5-7.6, 7.8	17	
14 Oct (F)	Lewis Struct. Pt. 2 (Resonance, Formal Charge, Bond Strength, Enthalpy)	7.2, 7.7, 7.9-7.10	17.5	
17 Oct (M)	Fall Break			
19 Oct (W)	Predicting Molecular Geometry - VSEPR	8.1	18	HW 5
21 Oct (F)	Valence Bond Theory, Orbital Hybridization	8.2-8.4	19	
24 Oct (M)	Polar Bonds and Polar Molecules	7.3, 8.5	20	Quiz 3
26 Oct (W)	Molec. Orbitals, Bond. Summary, Covalent Network Solids	8.7-8.9, 11.8	21	
28 Oct (F)	Transition Metals and Coordination Complexes	20.1, 20.5-20.6, 20.10	22	HW 6
31 Oct (M)	Molecular Presentations			HW 7
2 Nov (W)	Exam 3: Intro. to Bonding to Coordination Complexes			
4 Nov (F)	Intermolecular Forces	8.6	24	
7 Nov (M)	Vapor Pressure, Phase Changes	11.1-11.3, 11.9, Canvas	25	
9 Nov (W)	Intermolecular Forces, Solution Properties	12.1-12.4	26	
11 Nov (F)	Colligative Properties	12.5-12.8	27	
14 Nov (M)	Properties of Gases, Gas Laws	10.1-10.2	28	HW 8, Quiz 4
16 Nov (W)	Ideal Gas Equation, Reactions between Gases	10.3-10.4	29	
18 Nov (F)	Gas Mixtures, Partial Pressures	10.5	30	HW 9
21 Nov (M)	Exam 4 – Intermolecular Forces to Reactions between Gases			
23 Nov (W)	Thanksgiving Break			
25 Nov (F)	Thanksgiving Break			
28 Nov (M)	Kinetic Molecular Theory, Real Gases,	10.6-10.8	31	
30 Nov (W)	Earth's Atmosphere, Energy and Enthalpy	10.9-10.10, 9.1-9.4	32	
2 Dec (F)	Thermochemical Stoichiometry, Calorimetry	9.5-9.7	33	
5 Dec (M)	Hess's Law	9.8	34	
7 Dec (W)	Standard Enthalpy of Reaction, Combustion	9.9-9.11	35	HW 10 due Thur.
9 Dec (F)	Big Quiz: Earth's Atmosphere to Combustion			

12 Dec (M)	Reading Day – no classes			
13-16 Dec	Final Exam: All Topics (1st Semester ACS Gen. Chem.)			