Course Overview

Catalog Description
Introduction to core ideas in chemistry (structure and properties of matter, energy, and electrical forces) blended with science practices (use of models, argumentation, construction of scientific explanations, mathematical thinking) to understand and explain chemical phenomena.

Course Units
- Unit 1 – Particle Models for Matter, Motion, and Phase Changes
- Unit 2 – Atoms and the Periodic Table
- Unit 3 – Molecules and Bonding
- Unit 4 – Reactions

People

Instructor
Prof. Lynmarie A. Posey; email: poseyl@msu.edu
Office: 61 Chemistry; phone: 517-355-9715 ext. 210

Office hours: M 3–4 PM, W 2:30–3:30 PM, F 11:20 AM–12:20 PM, and other times by appointment. Any changes to Dr. Posey’s office hour schedule will be announced in advance.

N.B.: When sending email, please use your MSU email account and include “CEM 121” in the subject line.

Learning Assistant
Benjamin Brandicourt

Office hour schedule and contact information are provided in Desire2Learn (D2L).

Schedule

Weekly Class Schedule
Lecture: MWF 10:20–11:10 AM, 323 Chemistry

Recitations:
- Section 1: Tu 7:00–7:50 PM, 127 Chemistry
- Section 2: Th 3:00 PM–3:50 PM, 136 Chemistry

Recitations will begin the week of September 7. Recitations will not meet during Thanksgiving week.
Important Dates (Tests, Final Exam, & University Deadlines)*

<table>
<thead>
<tr>
<th>Important Dates</th>
<th>Event</th>
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<tbody>
<tr>
<td>September 25 (F)</td>
<td>Test #1</td>
</tr>
<tr>
<td>September 28 (M)</td>
<td>Last day to drop with refund (8 PM)</td>
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<tr>
<td>October 19 (M)</td>
<td>Test #2</td>
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<tr>
<td>October 21 (W)</td>
<td>Last day to drop with no grade reported</td>
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<tr>
<td>November 13 (F)</td>
<td>Test #3</td>
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<tr>
<td>December 7 (M)</td>
<td>Test #4</td>
</tr>
<tr>
<td>December 16 (W), 12:45–2:45 PM</td>
<td>Final Exam</td>
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*Test and final exam dates are fixed.

Announcements & Reminders

Course announcements will be posted as “News” in Desire2Learn (https://d2l.msu.edu). Reminders of test and final exam dates can also be found on the Desire2Learn (D2L) Calendar.

Outcomes, Objectives, & Expectations

Overall Course Learning Outcomes:

Students will

- develop in their understanding of several core ideas in chemistry (the structure and properties of matter and the role of electrical forces) and in their ability to apply these ideas to explain chemical phenomena.
- build capacity to engage with the science practices of using models, constructing scientific explanations, engaging in argumentation, and applying mathematical thinking.
- build a robust, transferrable understanding of core ideas in chemistry through integration with science practices to support learning in subsequent chemistry and other gateway science courses.

Learning Objectives

Specific learning objectives for each course unit will be provided in Desire2Learn (D2L). Taken together, the learning objectives detail what you should know, understand, and be able to do. As such, they can be used as a study guide when preparing for tests and the final exam as well as a self-assessment tool.
Alignment of CEM 121 with MSU’s Undergraduate Learning Goals

CEM 121 will provide students with ample opportunities to develop, apply, and refine their use of analytical thinking in the context of chemistry. The analytical thinking component of MSU’s Undergraduate Learning Goals encompasses acquisition of information coupled with critical analysis “to evaluate evidence, construct reasoned arguments, and communicate inferences and conclusions.” Specifically, this course will focus on

- synthesis and application of information and methods from the discipline of chemistry to develop an understanding of the structure and properties of matter and the governing role of electrical forces.
- identification and application of appropriate quantitative methods.

Teaching Philosophy and Expectation for Roles

I will serve as your coach and guide as you learn to use models and apply ideas in chemistry to understand and explain the structure and properties of matter. As your coach, I am responsible for setting up a training program to help you build your understanding of chemistry. Constructing knowledge is analogous to building muscle memory in sports; it doesn’t happen without practice and repetition. You cannot learn this material by simply watching; you must actively participate and engage with the material. What you get from this course will depend largely on the effort that you put in. You should not be afraid to ask questions. I want all of you to be successful in learning chemistry. Classes in this course will be guided by the motto “less talking from the front of the room, more talking and doing all around.”

Course Materials

Required Materials

Computer with Internet access (DSL, LAN, or cable connection desirable)

Scientific calculator

Instructor-Provided Course Materials

Course materials will be published in the Desire2Learn (D2L) course management system (https://d2l.msu.edu). Assistance with Desire2Learn is available 24/7 through MSU Distance Learning Services (aka. the Help Desk) at (517) 432-6200 or (844) 678-6200.

Access to the online beSocratic system for homework will be provided at no cost.

A composition book will be provided for developing your Chemistry Toolbox (see below).

Commercialization of Course Materials

MSU prohibits students from commercializing their notes of lectures and University-provided class materials without the written consent of the instructor. The instructor and Michigan State University retain copyright to all materials provided in this course unless otherwise indicated.

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1 Undergraduate Learning Goals developed by MSU’s University Committee on Liberal Learning, http://undergrad.msu.edu/programs/learninggoals
Grading

Grading Criteria
The grade in this course will be based on

- Four 50-minute tests (10% each) 40%
- Final exam 14%
- In-class work and daily reflections following class 10%
- Homework (beSocratic) 10%
- Recitations 10%
- Weekly reflections 8%
- Toolbox 8%

Grading Scale
The following fixed grading scale will be used to determine semester grades:

\[ \geq 90\% \ 4.0; \ 85–89\% \ 3.5; \ 80–84\% \ 3.0; \ 75–79\% \ 2.5; \ 70–74\% \ 2.0; \ 65–69\% \ 1.5; \ 60–64\% \ 1.0; \ < 60\% \ 0.0 \]

Standard rounding rules apply. Prof. Posey reserves the right to adjust the grading scale downward, but under no circumstances will the criterion for any grade be raised. Everyone has an opportunity to earn a grade of 4.0 in this course.

The deadline for reporting grade discrepancies and requesting regrades is 5 PM on Friday, December 11, 2015.

Tests
Four 50-minute, closed-book tests will be given during class. Equations and other useful information (periodic table, physical constants, etc.) will be provided when necessary. Sample equation sheets will be published in advance. Make-up tests will not be given. In the event of a missed test with an excused absence approved in advance, the weighted final exam score will be used in place of one missed test. For a second missed test, a grade of zero will be used in computing the semester grade. If the final exam score is higher than the lowest test score, it will be substituted for the lowest test score.

Final Exam
A cumulative final exam will be given on Wednesday, December 16, 2015, 12:45–2:45 PM. Students are reminded of the following University policy outlined in Academic Programs:

A student absent from a final examination without a satisfactory explanation will receive a grade of 0.0 on the numerical system, NC on the CR-NC system, or N in the case of a course authorized for grading on the P-N system. Students unable to take a final examination because of illness or other reason over which they have no control should notify the associate deans of their colleges immediately.
In-Class Work and Daily Reflections Following Class

You will be asked to do work during most class meetings. Most of the time, you will collaborate with members of your group to complete this work. From time to time, you will be asked to do an in-class activity on your own. Participate with an open mind. Be willing to share your ideas, and be respectful of the ideas of others. This work will provide formative assessment for both student and instructor and is intended to help you begin to synthesize and apply course content knowledge. You will receive full credit for making a good effort to complete the in-class work. Note that your answers for the in-class work do not have to be 100% correct to receive full credit (5 points); however, incomplete work will only receive partial credit (3 points or 1 point). Every member of a group will receive the same credit for any in-class work completed as a group. In-class work will count for 60% of the in-class work and daily reflections grade.

After each class, you will be asked to reflect on what you understand and the ideas that you are still working to understand. Prof. Posey will use your responses in planning the next class. These daily reflection assignments will be completed online in D2L as surveys. You can reach these assignments by selecting Content from the D2L Navbar. The daily reflection assignments are organized by month in content modules listed on the left side of the page. Each daily reflection assignment will be available immediately following class and must be completed by 11:30 PM on the same day. After you complete the daily reflection, a quiz will appear on the content page just below the listing for the completed daily reflection. The quiz has the statement “I completed today’s reflection.” Respond by selecting “True” to receive credit for the reflection assignment. Each daily reflection will receive 1 point for completion, and the daily reflections will count for 40% of the in-class work and daily reflections grade. You must attend class and complete any assigned in-class work in order to receive credit for the daily reflection.

Homework

Homework in this course will consist primarily of activities in the beSocratic online assessment system. You will also be asked to answer questions in the Qualtrics survey system from time to time. Homework will be assigned 2 or 3 times each week to coincide with the coverage of material in class.

There are a few things that you should keep in mind when completing activities in beSocratic. You should work on these activities independently without consulting resources such as books, the web, or friends. The goal is for you to practice constructing answers based on your understanding rather than for you to simply copy down someone else’s ideas. Credit will be given for completion of these activities with your best effort rather than for the correctness of responses. Sometimes homework will cover content before it is discussed in class because we are interested in your pre-existing knowledge. What you already know or think impacts your learning. Homework assignments will be discussed in class.

A link to each beSocratic homework activity will be provided in D2L. Links for questionnaires administered through the Qualtrics survey system will be sent to your MSU email account. It is important that you check your MSU email account regularly because this is the official channel that the University and your instructors will use to communicate with you. I would discourage you from forwarding your MSU email to another account because other mail servers may reject
email forwarded from MSU accounts. Failure to look at your MSU email or loss of email in forwarding is not a valid excuse for missing homework assignments.

Recitations
Recitations meet weekly, except during the first week of the semester and Thanksgiving week. Recitations begin on September 8. The learning assistant (LA) for CEM 121 will have activities and problems for you to work on and discuss during each session. Recitations immediately preceding a test will be used for review, which may include problems for you to work on. Time is planned in recitations that meet during the week following tests for discussion of the test. Recitations also provide an opportunity to ask questions about anything related to the course.

Attendance and participation in recitations counts for 10% of the semester grade. Your work in recitation will be graded on a 5-point scale with a solid effort to participate and complete the work receiving full credit. Full credit for recitation attendance and participation can be earned by attending 12 of the 13 recitation meetings. If you attend all 13 recitations, all of the points earned for recitations will be used in computing your recitation score.

Weekly Reflections
Each week you will be asked to answer a series of questions in a weekly reflection assignment. The questions will vary from week to week. Some of the questions are designed to get you to reflect on your learning and studying in CEM 121. Other questions will ask about your transition to MSU as a new student. Finally, some of the questions will be more “philosophical” in nature, such as asking you about what you think science is, what you think scientists do, and whether you see yourself as being part of what you consider to be science. It is important to answer these questions honestly with some thought. We want to be able to help you and to help you help yourself!

The reflections for each week will be available starting at 9 AM on Thursday and must be completed by 11:30 PM on Sunday. They will be graded on a 5-3-1 scale: 5 points for a good effort with some evidence of thoughtfulness in responding, 3 points for an acceptable effort that could be improved by taking a little more time to respond, and 1 point for attempting some questions but not completing the reflection.

Toolbox
Over the course of the semester you will be developing a personal Chemistry Toolbox with our guidance that you can use in CEM 121 and CEM 141. The Toolbox is intended to help you identify themes/big ideas in chemistry, organize your ideas about chemistry, and make connections between ideas in chemistry. Your toolbox may also include problem-solving strategies. Toolbox notebooks will be collected on the day of each test and the final exam for review and grading. We are interested in what each of you includes in your Toolbox as being important to helping you understand and use ideas in chemistry. Toolbox notebooks collected at the final exam will be returned at beginning of next semester so that you have them available while you are taking CEM 141. A composition book to use in creating your Chemistry Toolbox will be provided.
**Why is it important to develop a Toolbox?** Experts in scientific disciplines organize their knowledge around the big or central ideas in the discipline and the relationships between these big ideas. We want you to become more expert-like in your ability to use ideas and make connections between ideas in chemistry.

**Academic Integrity**

By enrolling as a student at Michigan State University, you have joined an academic community built on trust and mutual respect. As stated in *Academic Freedom for Students at Michigan State University*, “The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards.” As such, each time that you submit work for a grade you are attesting that this work is your work and that it has been prepared following the guidelines provided for the assignment. Further, if you observe an act of academic dishonesty, you are obligated to report it to the instructor. In any work that involves collaboration, you are expected to make a good-faith effort to contribute.

The Department of Chemistry adheres to *MSU Policies, Regulations and Ordinances Regarding Academic Honesty and Integrity* (https://www.msu.edu/~ombud/academic-integrity/index.html). In this course, any student who cheats by copying the work of others, using unauthorized materials, or communicating with others during a test or final exam will receive a penalty grade of 0. Students who submit in-class work for another student who is not present will receive no credit for their work on that day.

An Academic Dishonesty Report will be filed as required by MSU policy any time that a penalty grade is given. A student’s academic dean will receive this report, and it will be added to the student’s academic record. If a student feels that he/she has been unjustly accused of academic dishonesty, he/she should first meet with Prof. Posey to resolve the dispute. If dissatisfied with the outcome of this meeting, the student can meet with the Chair of the Department of Chemistry. Finally, a student can contest an allegation of academic dishonesty and penalty grade by filing a grievance with the University Academic Integrity Hearing Board after meeting with Prof. Posey and the Chemistry Department Chair.

**Attendance & Classroom Etiquette**

**Attendance**

In-class work is integral to this course. To encourage your attendance and participation in class, 10% of the semester grade is tied to in-class work and the daily reflection on your understanding of material covered in each class. You may miss three classes without penalty. For every additional class missed, you will lose 5 points from your in-class work score.

Attendance at recitations is also strongly encouraged. Completion of recitation activities will count for 10% of the semester grade.

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2 Academic Freedom for Students at Michigan State University, Article 2: Academic Rights and Responsibilities (http://splife.studentlife.msu.edu/academic-freedom-for-students-at-michigan-state-university/article-2-academic-rights-and-responsibilities)
Classroom Etiquette

• Please turn your cell phone off during class; otherwise, Prof. Posey might have to answer your phone for you, which could be embarrassing.
• Please be courteous and respectful of the opinions and contributions of others.
• Participate in discussions with your group. The rest of your group wants to hear what you have to say.
• If you must arrive in class late or leave early, please show your classmates respect by doing this with minimum disruption.
• Please refrain from using headphones, earbuds, and cell phones during class.
• Cell phones, tablets, and computers should be put away during class, unless instructed otherwise. Not only are they a distraction to the user, research has shown that the use of electronic devices negatively impacts the performance of other students who are seated near the user.
• No electronic devices (cell phones, tablets, iPods, MP3 players…) except calculators are permitted during tests and the final exam.

Media Derived from the Classroom

As members of a learning community, students are expected to respect the intellectual property of course instructors. All course materials presented to students are the copyrighted property of the course instructor and are subject to the following conditions of use:

1. Students may record lectures or any other classroom activities and use the recordings only for their own course-related purposes.
2. Students may share the recordings with other students enrolled in the class. Sharing is limited to using the recordings only for their own course-related purposes.
3. Students may not post the recordings or other course materials online or distribute them to anyone not enrolled in the class without the advance written permission of the course instructor and, if applicable, any students whose voice or image is included in the recordings.
4. Any student violating the conditions described above may face academic disciplinary sanctions.

Americans with Disabilities Act Accommodations

Michigan State University is committed to providing equal opportunity for participation in all programs, services, and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities by phone at 517-884-RCPD or through the web at rcpd.msu.edu. Once your eligibility for an accommodation has been determined, you will be issued a verified individual services accommodation (“VISA”) form. Please present this form to Prof. Posey at the start of the semester and/or at least two weeks prior to the accommodation date (test, final exam, homework, etc.). Requests received after this date will be honored whenever possible. Web-accessible course materials will be provided upon request.