CHEM 111: Introductory Chemistry I

Dr. Dan Albert

Fall 2020

Contact Information

e-mail: daniel.albert@millersville.edu
phone: 717-871-7391
office: Caputo Hall 214
The best way to reach me is via university e-mail.

Virtual Classes and Meetings

All class meetings and office hours will take place via Zoom. The link for the meeting is https://millersville.zoom.us/j/99933029820
Meeting ID: 99933029820 Meeting Password: DrAchem

Office Hours

Office Hours are a great opportunity to get individualized support from me. All Office Hours will be held using Zoom and will be open to all students in the course. If you need to meet at a different time or have a private matter to discuss, please contact me and I would be happy to set-up an individual meeting with you via Zoom. The scheduled times for Office Hours are as follows:

• Monday Afternoons from 12 - 1 pm
• Tuesday Evenings from 9 - 10:30 pm
• Wednesday Mornings from 10 - 11 am
• Wednesday Afternoons from 3 - 4 pm
• Thursday Mornings from 10 - 11:30 am

If you cannot make it to office hours please feel free to set-up an alternative time to meet with me by corresponding with me via e-mail.
Course Description

The properties and theories of the solid, liquid and gaseous states of matter, the stoichiometry and thermochemistry of chemical reactions, and theories and applications of molecular structure and bonding. Intended for science majors: biology, chemistry, earth sciences, physics.

Prerequisites

Chemistry Placement Test into CHEM 111 or CHEM 110 with a grade of C- or higher; and Math Placement Test of Math 160 or higher or Math 101 with a grade of C- or higher; or permission of instructor. *Proficiency in algebra is essential.*

Course Purpose

Use chemical principles to think about and solve problems in a variety of contexts! *The problem solving techniques and approaches we use in this class are broadly applicable to thinking about many questions you will encounter in your life!*

Course Learning Objectives

- Be able to use qualitative and quantitative skills to solve chemistry problems
- Be able to use chemical theories to explain chemical and physical phenomena
- Be able to organize, present, and interpret data to draw reasonable conclusions
- Be able to explain natural phenomena encountered using chemical principles
- Be able to use appropriate and safe laboratory procedures
Meeting Times

• Section 52A
  Lecture: TR from 2:35 - 3:50 pm via Zoom
  Recitation: Wednesday from 9:00 - 9:50 am via Zoom
  Laboratory: Asynchronous - 2 Hours Each Week on your own time.

• Section 52B
  Lecture: TR from 2:35 - 3:50 pm via Zoom
  Recitation: Wednesday from 9:00 - 9:50 am via Zoom
  Laboratory: Asynchronous - 2 Hours Each Week on your own time.

Required Materials

• Textbook: *Chemistry 2e* by Flowers, Theopold, Langley, and Robinson; OpenStax, 2019. ISBN: 978-1-947172-61-6
  Good news: your textbook for this class is available for free online!
  Your book is available in web view and PDF for free. You can also purchase on iBooks for $4.99 or get a print version, if you prefer, on Amazon.com for about $55.
  You can use any of the formats. Web view is designed to work well on any device.
  The textbook can be found at [https://openstax.org/details/books/chemistry-2e](https://openstax.org/details/books/chemistry-2e)

• Scientific Calculator: Your calculator for this course must be able to handle logarithms and exponents. This type of calculator can be found for around $10.

• Laboratory Notebook: Permanently bound notebook (No perforations or binders)

• Regular access to D2L (https://millersville.desire2learn.com/), Zoom, and university email

Class Environment

I value a learning environment that is engaging, respectful, and helpful. I ask that you help maintain a learning environment that meets these goals for everyone in the class. Anyone whose behavior is disruptive of the learning environment for others in the class will be asked to leave.

My goal is for you to feel comfortable, appreciated, fairly treated, and encouraged to challenge yourself and obtain success. *Please come talk to me if there is anything I can do to help support you in achieving success.*
Title IX

Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment, comply with Title IX of the Education Amendments of 1972, 20 U.S.C. §1681, et seq., and act in accordance with guidance from the Office for Civil Rights, the University requires faculty members to report to the University’s Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty members reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report to the person designated in the University Protection of Minors policy incidents of sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred.

Information regarding the reporting of sexual violence, and the resources that are available to victims of sexual violence, is available at [http://www.millersville.edu/socialeq/title-ix-sexual-misconduct/index.php](http://www.millersville.edu/socialeq/title-ix-sexual-misconduct/index.php)

Grading

All grades in this course are assigned by the instructor of record. Your grade in this course will be calculated using the following components and weighting.

<table>
<thead>
<tr>
<th>Category</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Group Participation</td>
<td>10</td>
</tr>
<tr>
<td>Skill Checks</td>
<td>15</td>
</tr>
<tr>
<td>Problem Sets</td>
<td>15</td>
</tr>
<tr>
<td>Regular Exams</td>
<td>30</td>
</tr>
<tr>
<td>Final Exam</td>
<td>10</td>
</tr>
<tr>
<td>Labs</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Your final grade will be determined by your overall percentage grade in the course using the grading scheme described above.

In order to pass CHEM 111 to move onto CHEM 112 you must have a grade higher than an F in both the lecture/recitation (Small Group Participation, Skill Checks, Problem Sets, Regular Exams, and Final Exam) and laboratory (Labs) portions of the class. The cut-off percentages for each grade are given below. I reserve the right to lower grade cut-offs, but under no circumstances will the grade cut-offs be higher than those listed below.
<table>
<thead>
<tr>
<th>Grade Cut-off (%)</th>
<th>Letter Grade</th>
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</thead>
<tbody>
<tr>
<td>93</td>
<td>A</td>
</tr>
<tr>
<td>90</td>
<td>A-</td>
</tr>
<tr>
<td>87</td>
<td>B+</td>
</tr>
<tr>
<td>83</td>
<td>B</td>
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<tr>
<td>80</td>
<td>B-</td>
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<tr>
<td>77</td>
<td>C+</td>
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<tr>
<td>73</td>
<td>C</td>
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<tr>
<td>70</td>
<td>C-</td>
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<tr>
<td>67</td>
<td>D+</td>
</tr>
<tr>
<td>63</td>
<td>D</td>
</tr>
<tr>
<td>60</td>
<td>D-</td>
</tr>
<tr>
<td></td>
<td>F</td>
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</tbody>
</table>

**Small Group Participation**

During lectures and recitations we will often work on questions and material in small groups. You are expected to attend and actively contribute to the problem-solving and discussions occurring in the small groups. You are not graded on mastery of material in these groups, simply being an active participant in these portions of the class will qualify you as participating. I will routinely visit the groups and periodically collect work from the groups to account for your participation.

**Skill Checks**

We will have weekly skill checks so that both you and I can see your progress in the course. Skill checks will need to be completed by 11:59 pm on Friday Evenings. These checks will consist of five to ten questions on D2L (https://millersville.desire2learn.com/). You will have up to three opportunities to take the skill checks and only your highest score will count towards your grade. The skill checks due Fridays will be released after class on Tuesdays.

**Problem Sets**

Eleven problem sets will be given throughout the semester. Each problem set will consist of 5 graded problems. Suggested problems for the course consist of the questions that have provided solutions at the end of each reading. I strongly suggest that you attempt the suggested problems *before* working on the graded problems. The graded problems are typically the most difficult problems and it is best to build towards solving them. Detailed solutions to the graded problems will be available after the graded problems are collected. Each problem set is equally weighted in the problem set category. Problem Sets are due by 11:59 pm on Tuesday evenings.

All problem sets and detailed solutions can be accessed via D2L (https://millersville.desire2learn.com/)
Regular Exams

Three regular exams will be given during our regular lecture meeting times. Each exam will contain one or more of the following types of questions: multiple choice and worked problems. All exams in this course are considered cumulative, but will focus on the material covered since the last exam. Each regular exam is equally weighted in the regular exam category. Exams are open note and resources, but NOT open for collaboration with other people (virtual or in-person). Exams will be given via D2L.

If your percentage grade on the final exam is higher than your lowest percentage regular exam score, your percentage grade on the final will replace your lowest regular exam score. For example, if you earn a 60% on Exam 1, a 85% on Exam 2, a 95% on Exam 3, and an 80% on the Final Exam, your 60% on Exam 1 will be replaced and become an 80% (your percentage score on the Final Exam).

Final Exam

A two hour cumulative final exam will be given at the end of the semester. The final exam will take place on Friday December 11th from 12:30 - 2:30 pm on D2L. The format of the final will be similar to that of the regular exams.

Labs

For every laboratory experiment each student must independently work through the laboratory assignment and submit the appropriate work. This could include submission of written work and/or quizzes related to the lab.

You are advised to keep a dedicated lab notebook for the laboratory potion of the course and to build good habits of recording all laboratory work and observations in your notebook in pen.

Completed weekly laboratory notebooks are due by 11:59 pm on Sunday Evenings.
Attendance, Absences, and Make-Ups

Attendance at every lecture, recitation, and lab is expected. If you must miss a lecture or recitation, please see a fellow classmate for notes. I will post all handouts and presentations during the semester to D2L.

Late or Make-Up Problem Sets, Labs, and Exams will not be allowed except under special circumstances and prior notification is required unless it is an emergency situation. Some examples of special circumstances are below.

- Required religious observation
- Participation in a Millersville University athletic event
- Armed forces related training or drills
- Medical Illness/Emergency
- Death in the family
- If you feel that you have a special circumstance that is of similar importance to the items listed above, please come talk with me as soon as possible and I will work with you to try and find a solution

Academic Honesty

The Millersville University Academic Honesty Policy states that:

Students of the University are expected to be honest and forthright in their academic endeavors. To falsify the results of one's research, to steal the words or ideas of another, to cheat on an examination, to allow another person to commit, or assist another in committing an act of academic dishonesty, corrupts the essential process by which knowledge is advanced.

The entire academic honesty policy can be found at [http://www.millersville.edu/english/for-faculty/academic-integrity/index.php](http://www.millersville.edu/english/for-faculty/academic-integrity/index.php)

All work that is turned in for a grade should be completed individually by the person whose name appears on the work. Students found to have violated the academic honesty policy will receive a score of zero on the assignment. Repeated instances of academic misconduct will be given the harshest punishment.
Suggestions for Course Success

My expectation is that you are working on CHEM 111 material for a minimum of 8 hours every week outside of class. This effort needs to be consistent throughout the semester to get the most out of this course.

- Work on chemistry a little bit every day.
  Set aside 60 to 90 minutes each day to work on chemistry outside of class.

- Read the textbook and work example problems before class.

- Attend, participate, and take notes at all lectures and recitations.
  Ask questions during class. I love to get questions during class.
  Take notes to capture key points and ideas.

- Re-Read the textbook after class and fill-in your notes with additional details.

- Work at least five new problems a day.
  At a minimum you should be working all of the suggested problems.
  The way you work through a problem matters.
  Try to work problems by minimally looking at your notes or the textbook.
  Starting problems is the most difficult part. Give yourself five minutes.
  Solve problems from start to finish by yourself.

- Utilize helpful resources.
  Form study groups.
  Come to recitation with questions.
  Come to office hours.
  Stop by my office and ask questions. We can always find a time to meet.

Important Dates

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>9/1</td>
<td>Last Day to Add or Drop a Course Online</td>
</tr>
<tr>
<td>10/30</td>
<td>Last Day to Withdraw from Course and Receive a ‘W’</td>
</tr>
<tr>
<td>11/21 - 11/29</td>
<td>No Classes for Thanksgiving Break</td>
</tr>
<tr>
<td>12/11</td>
<td>CHEM 111 Final Exam at 12:30 pm</td>
</tr>
</tbody>
</table>
# Course Schedule

The instructor reserves the right to change this schedule as needed. Any changes will be communicated via an in-class announcement.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Reading</th>
<th>Exam Dates</th>
<th>Laboratory Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/24</td>
<td>Essential Ideas for Chemistry</td>
<td>1.1 - 1.6</td>
<td></td>
<td>Lab Safety</td>
</tr>
<tr>
<td>8/31</td>
<td>Atoms, Molecules, and Ions</td>
<td>2.1 - 2.8</td>
<td></td>
<td>Measurements and Density</td>
</tr>
<tr>
<td>9/7</td>
<td>Composition of Substances</td>
<td>3.1 - 3.2</td>
<td></td>
<td>Formula of Hydrate</td>
</tr>
<tr>
<td>9/14</td>
<td>Solutions</td>
<td>3.3 - 3.4</td>
<td>Exam #1 on 9/17</td>
<td>Identification of Common Chemicals I</td>
</tr>
<tr>
<td>9/21</td>
<td>Stoichiometry</td>
<td>4.1 - 4.3</td>
<td></td>
<td>Identification of Common Chemicals II</td>
</tr>
<tr>
<td>9/28</td>
<td>Stoichiometry</td>
<td>4.4 - 4.5</td>
<td></td>
<td>Titrations of Acids and Bases</td>
</tr>
<tr>
<td>10/5</td>
<td>Energy</td>
<td>5.1 - 5.3</td>
<td></td>
<td>Gravimetric and Volumetric Analysis</td>
</tr>
<tr>
<td>10/12</td>
<td>Electronic Structure</td>
<td>6.1 - 6.5</td>
<td></td>
<td>Heat of Reaction</td>
</tr>
<tr>
<td>10/19</td>
<td>Bonding</td>
<td>7.1 - 7.4</td>
<td>Exam #2 on 10/22</td>
<td>Spectrophotometry</td>
</tr>
<tr>
<td>10/26</td>
<td>Bonding</td>
<td>7.5 and 8.1 - 8.3</td>
<td></td>
<td>Analysis of Aspirin</td>
</tr>
<tr>
<td>11/2</td>
<td>Gases</td>
<td>9.1 - 9.6</td>
<td></td>
<td>Molecular Models</td>
</tr>
<tr>
<td>11/9</td>
<td>Liquids and Solids</td>
<td>10.1 - 10.6</td>
<td></td>
<td>Gas Laws</td>
</tr>
<tr>
<td>11/16</td>
<td>Solutions</td>
<td>11.1 - 11.3</td>
<td>Exam #3 on 11/19</td>
<td>Light and Matter Interactions</td>
</tr>
<tr>
<td>11/23</td>
<td>Thanksgiving</td>
<td></td>
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</tr>
<tr>
<td>11/30</td>
<td>Colligative Properties</td>
<td>11.4 - 11.5</td>
<td></td>
<td>Identifying Unknowns with Chemical Reactions</td>
</tr>
<tr>
<td>12/7</td>
<td>Final Exam</td>
<td></td>
<td>Final Exam on 12/11</td>
<td></td>
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</tbody>
</table>