Overview

This course is designed as an undergraduate introductory chemistry course that provides a broad survey of chemistry. We will start with a discussion of matter and the behavior of electrons. From this discussion we will proceed into measurements in chemistry and how compounds form. We will then proceed to a discussion of molecular properties and finish with a discussion of chemical reactions and stoichiometry.

During the term, students will complete frequent online homework assignments. There will be weekly quizzes, and at the end of the course, students will complete a cumulative final exam.

CHEM 1015 (lecture) when taken with CHEM 1017 (lab) is an introductory chemistry course with accompanying lab course that meets the core Physical Science requirement. This course may meet a chemistry or physical science requirement or serve as a bridge between high school chemistry and CHEM 1061.

Prerequisites

This course is designed for students who have already taken a high school chemistry course or its equivalent. Also, two years of high school math (especially algebra) are important for success in this course, as proportions, exponents, logarithms, and anti-logarithms are used extensively in CHEM 1015.
Goals

As a component of your undergraduate education here at the University of Minnesota, this course will offer you the opportunity to identify, define, and solve problems and will provide a strong foundation for the mastery of knowledge in the chemical sciences.

Because CHEM 1015 is designed to prepare students for CHEM 1061, when students leave CHEM 1015, they should have the following skills.

- Content mastery
- Ability to solve a variety of multistep chemistry problems correctly in a timed environment
- Time and resource management

Course mastery is required because CHEM 1061 builds on content from CHEM 1015. Because the bulk of your overall course grade is determined by your exam performance, **it is essential that you are able to demonstrate this mastery during timed exams.** CHEM 1061 also has timed, often exclusively multiple-choice exams.

You are responsible for managing your time and resources effectively. Homework assignments are due throughout the semester to help you keep on track. There are a variety of resources available during class and on our course website designed to help you be successful in the course. You must seek out these resources and use them effectively. If developed now, time and resource management skills will serve you throughout your college career.

Course Materials

*All course materials are available for purchase from U of M Bookstores in Coffman Union and St. Paul Student Center.*

Required


Access to an internet-capable computer with Google Chrome, a working webcam, and a working microphone

Laminated periodic table and equation sheet: used when you take quizzes and exams

Dry-erase marker: used when you take quizzes and exams

Mirror or other reflective surface: approximately 6” by 6”; used when you take quizzes and exams

Non-programmable scientific calculator

Recommended


Free use during office hours, from the tutors in the General Chemistry tutor room, or on reserve in Walter Library

$22 for online purchase at [http://z.umn.edu/1015solutions](http://z.umn.edu/1015solutions)

Molecular modeling kit

Inclusive Access

This semester we will be using the 2nd edition of Burdge/Driessen’s *Introductory Chemistry* with ALEKS. You can access your E-text via the ALEKS link in our course Canvas site.

We are making the course material available because it is much more cost-effective than purchasing the physical book. Your student account will be charged $80.00 before the beginning of the semester for access. Those wishing to opt out and purchase their textbook elsewhere are refunded after the drop/add period. All students who drop the course within the drop/add period will be automatically refunded.

An E-mail will be sent to all students with opt out instructions. The E-mail will have the subject line “Course Materials Charged on Your Student Account” and will come from verbasoftware.com. Sometimes the message goes to a spam or junk folder, so please be on the lookout for this message. Students have until September 15, 2019, to opt out of the course material. If you have additional questions, contact UMN Bookstores directly at inclusiveaccess@umn.edu.
Course Websites

Lecture Canvas site. Students registered in this course must use the Canvas site created for this class. This site is where you will find any information associated with the lecture portion of the course. It will contain a course calendar, syllabus, and resources to help you succeed in our course. You will take quizzes through Proctorio, accessed through the course Canvas site. You will find your exam and homework scores posted here as well, under the “Grades” link.

ALEKS site. There is a link from the lecture Canvas site to the ALEKS homework system. Follow the instructions there to set up your account correctly.

How to be Successful in CHEM 1015

Every student defines success differently. At the beginning of the term, define your goal(s) for CHEM 1015 and make a specific, detailed plan on how to get there. If you get nothing else, take this: **Watching lecture videos and doing the online homework IS NOT ENOUGH to prepare you to do well on exams.** You must practice the material *on your own* in depth and often.

In the past, students who have been successful in the course:

- Skim the textbook before each lecture video so that the lecture video is not the first time seeing the material
- View every lecture and take excellent notes
- Actively work on practice problems given during each lecture video
- Spread out watching lecture videos over several days instead of binge watching
- Complete all of the suggested practice problems for each chapter
- Finish the online homework on time
- Practice for exams as recommended
- Review and correct mistakes made during videos, practice problems, homework, and exams

ALEKS Homework

You will have regular, required assignments using ALEKS, and you can expect to spend at least several hours a week working on them. Just how much time you have to spend will depend on how efficiently you use ALEKS. An introduction is posted on our course Canvas site to help you get the most from ALEKS with the least time and effort. You must follow the instructions in Canvas to ensure you’re registered for the correct homework site, and you must use your UMN E-mail address (@umn.edu) to earn credit. Because assignments are available well in advance of the due date, no make-up opportunities are allowed.

Calculators

Acceptable calculators. Any one-line display calculator is allowed. The TI-30Xa is the suggested calculator for this and all CHEM 1XXX courses and for most introductory physics courses. The TI-30X IIS is an acceptable two-line calculator. These calculators are available in the U of M Bookstores. Many other two-line calculators are programmable and would therefore not be allowed. If you are concerned about whether or not your calculator would be acceptable, you could purchase the recommended calculator for the course, just in case.

Sharing calculators during quizzes. Calculators may not be shared during quizzes. If you are concerned about battery failure during the quiz, bring a second calculator or extra batteries with you.

Can I use my graphing calculator?

No. Graphing and/or programmable calculators are FORBIDDEN on quizzes and exams. Their presence during, or use on, a quiz and/or exam will be considered cheating. Only non-programmable calculators with limited memory will be allowed for use during quizzes and exams.
Grading

I want to encourage you to work hard in our class and give you many opportunities to demonstrate and apply what you are learning. You will demonstrate your mastery of our course material through working in ALEKS (online homework) throughout the semester and by completing quizzes that assess your mastery of Essential and Advanced skills in our class.

Students will be evaluated based on online homework performance and exam performance only. The grading breakdown is as follows. You must meet ALL conditions in a grade’s row in order to earn that grade.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Weekly ALEKS HW</th>
<th>ALEKS Full Pie</th>
<th>Skills Quiz Credits</th>
<th>Essentials Quiz Credits</th>
<th>Advanced Quiz Credits</th>
<th>Final Exam*</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>≤ 50% AND ≤ 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>≥ 50% AND ≥ 50%</td>
<td>4 AND 1+</td>
<td></td>
<td></td>
<td></td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>D+</td>
<td>≥ 50% AND ≥ 50%</td>
<td>4 AND 9+</td>
<td></td>
<td></td>
<td></td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>C-</td>
<td>≥ 90% AND ≥ 80%</td>
<td>4 AND 9+</td>
<td></td>
<td></td>
<td></td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>C</td>
<td>≥ 90% AND 100%</td>
<td>4 AND 11+</td>
<td></td>
<td></td>
<td>AND 0-1</td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>C+</td>
<td>≥ 90% AND 100%</td>
<td>4 AND 11+</td>
<td></td>
<td></td>
<td>AND 2-3</td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>B-</td>
<td>≥ 90% AND 100%</td>
<td>4 AND 11+</td>
<td></td>
<td></td>
<td>AND 4-5</td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>B</td>
<td>≥ 90% AND 100%</td>
<td>4 AND 11+</td>
<td></td>
<td></td>
<td>AND 6-7</td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>B+</td>
<td>≥ 90% AND 100%</td>
<td>4 AND 11+</td>
<td></td>
<td></td>
<td>AND 8-9</td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>A-</td>
<td>≥ 90% AND 100%</td>
<td>4 AND 11+</td>
<td></td>
<td></td>
<td>AND 10-11</td>
<td>≥ 80 points</td>
</tr>
<tr>
<td>A</td>
<td>≥ 90% AND 100%</td>
<td>4 AND 11+</td>
<td></td>
<td></td>
<td>AND 12+</td>
<td>≥ 80 points</td>
</tr>
</tbody>
</table>

* If you earn 130 or more points on the final exam, your letter grade will increase one shaded level (C- to C, for example), up to a letter grade of A.
* If you earn fewer than 80 points on the final exam, your letter grade will decrease one shaded level (B- to C+, for example), down to a letter grade of F.

**ALEKS.** You must earn at least 90% average on weekly homework assignments and have a full pie at the end of the semester to earn a grade of C or higher in the course.

**Skills.** Throughout the semester, you will need to complete four (4) CHEM 1015 Skills quizzes. The availability of these quizzes will be announced via E-mail and Canvas, starting with the first Skills quiz the first week and subsequent quizzes every 3-5 weeks thereafter. These quizzes will be related to the course itself (Example question: When is Homework G due?) and are designed to help you
navigate the course and resources you are provided within this online course. You will be able to retake each Skills quiz as many times as needed to earn credit. You must earn 100% on a Skills quiz to earn credit.

**Essentials.** On Fridays, you will take a 30 minute Essential quiz that covers skills identified as fundamental for CHEM 1015 students. There are 13 Essential quizzes (one per chapter). The skills on this quiz will be related to that week's course content. In order to earn credit for that week's Essential quiz, you must earn at least 80% on the Essential quiz.

- If you earn 80% on your first try, you can either stop or continue onto the week's Advanced quiz.
- If you earn less than 80% on your first try, you can retake the Essential quiz the following Monday.
  - The retake quiz will not be identical.
  - I encourage you to spend time between Friday and Monday studying the week’s essential skills so that you can succeed on your retake. You can view your Essentials quiz and how it was graded one time.
  - If you earn less than 80% on your Essential quiz retake or do not retake the Essential quiz, you will not earn credit for that week’s Essential quiz.

Please note that you must earn 80% on your first try in each week’s Essential quiz in order to have an opportunity to access the week's Advanced quiz. If you earn less than 80% on your first attempt at the Essential quiz, you will not be able to take the Advanced quiz for that week.

**Advanced.** After earning at least 80% on your first try at the week’s Essential quiz, you can take a 30 minute Advanced quiz on the same day (Friday) that covers skills identified as above the level required for CHEM 1015 students. There are 13 Advanced quizzes (one per chapter). The skills on this quiz will be related to that week's course content. In order to earn credit for that week's Advanced quiz, you must earn at least 80% on the Advanced quiz.

- If you earn 80% on your first try, you are done with quizzes for the week.
- If you earn less than 80% on your first try, you can retake the Advanced quiz the following Monday.
  - The retake quiz will not be identical.
  - I encourage you to spend time between Friday and Monday studying the week’s advanced skills so that you can succeed on your retake. You can view your Advanced quiz and how it was graded one time.
  - If you earn less than 80% on your Advanced quiz retake or do not take the Advanced quiz retake, you will not earn credit for that week’s Advanced quiz.

**Final Exam.** You must earn at least 80 points on the Final Exam in order to earn a grade of D or higher in the course. There are 160 possible points, and no retakes are possible. The Final Exam will be a 120 minute exam, cumulative, and will cover all material presented in the course.

For more information, please see policy.umn.edu/education/gradingtranscripts.
Quizzes

Location. You can take your quizzes and Final Exam in any quiet, private or semi-private location of your choosing, as long as it has reliable, stable internet access for the duration of your quiz.

Times. On Fridays, quizzes will be available on Canvas from 4 am to 4 pm. I strongly encourage you to begin your Essential quiz no later than 2 pm on Fridays to help ensure you have time to complete both the Essential and Advanced quizzes and help account for any technical difficulties you may encounter. You will not be able to access any quizzes after 4 pm Fridays. Please note that you do not have to take the Essential and Advanced quizzes back-to-back, but you must take them on the same calendar day.

On Mondays, retake quizzes will be available from 6 am to 12 pm (noon). Again, I encourage you to begin the retake quiz no later than 10 am on Mondays to help account for any technical difficulties you may encounter. You will not be able to access any quizzes after noon Mondays.

All quizzes and the Final Exam will be proctored electronically using Proctorio. Adjust your schedule NOW, and plan any travel, weddings, employment opportunities, meetings, etc. around these quiz dates and times. If you have conflicts with any of these exam dates and times, you should resolve them immediately or drop the course.

All quizzes, including the Final Exam, will be given ONLY at the scheduled dates and times. No make-up quizzes or alternative quiz dates are an option under any circumstances. If you are enrolled in a UMN course with a time conflict, you must submit a course conflict form. The Final Exam must be completed in order to earn a passing grade in the course.

Format. Quizzes will consist of multiple choice, short answer, fill-in-the-blank, and matching questions and will cover material as outlined in the course calendar. The quizzes will be proctored and graded by a computer. Make sure you fully understand how to set up your computer and prepare for E-proctoring in advance of the actual quiz (details are provided on Canvas). The Final Exam will be cumulative and cover all material presented in the course.

Materials. You must have your U-Card, periodic table/equation sheet, dry erase marker, and a mirror at each of the quizzes and the Final Exam. All quizzes and the Final Exam are closed book and closed note, and no study aids are permitted, except those provided with the quiz itself. No smart phones, cell phones, programmable calculators, or other such electronic devices may be used at any time. Only non-programmable, non-graphing calculators are allowed (see specific Calculators policy).

Quiz regrades. Regrade requests must be submitted, via E-mail directly to the instructor, within seven days of quiz score posting.

Missed quizzes. In situations of a true emergency, serious illness, or University-sponsored travel, an excused absence may be granted for a quiz. To obtain an excused absence, students must contact the instructor as soon as circumstances allow to discuss the nature of the emergency and to arrange for documentation. The unweighted average of all the student’s other quiz scores will replace the zero from the excused quiz. Only one missed quiz will be replaced in this fashion. If circumstances prevent a student from taking more than one quiz, a meeting must be scheduled immediately with the instructor to discuss any options available. Student-athletes with a travel letter who miss a quiz due to University-related travel should also contact the instructor early in the semester to determine what arrangements may be able to be made. For more information, please see: http://policy.umn.edu/education/makeupwork.
Tutoring

**General chemistry tutor room.** General chemistry tutors are available for free on a drop-in basis during the semester in 124 Smith Hall (the schedule is posted on our course Canvas page and on the door of the tutor room). The tutors are there to help you learn and not to simply give you answers. The tutors are actually instructed to ask you questions that will help you understand what concept you are missing that is preventing you from solving a particular problem. Solving the problem yourself with a tutor’s guidance will enhance the depth and retention of your knowledge.

It is important to me that your time is well spent in the tutor room. If tutors are not present at scheduled times, are not helpful, or if they leave for extended periods of time, please let the Head General Chemistry TA (genchem@umn.edu) or me know immediately.

**Private tutors.** A list of people available for hire as private tutors is available on our course Canvas site, if this is something you’re interested in.

Grading Policies

**S/N grading.** If you are registered for this class on an S/N basis, a grade equivalent to C- or above on the A-F scale will be required to earn an S, and a grade equivalent to D+ or below will earn an N. Many programs and transfer courses do not like S/N grading and will assume it represents the minimum possible grade. Monday, September 16, is the last day to change the grading basis for the semester.

**Incompletes.** Students who have an excused absence from the Final Exam and have taken all Essential quizzes may be eligible to earn a grade of I in the course. Incompletes will not be granted if the student is not passing based on the work up to the Final Exam. This grade is NOT routinely assigned. Any grade of I must be made up the following semester. After that time, all grades of I will become grades of F. You must fill out an Incomplete Request form (available in 115 Smith Hall) and have it signed. See your instructor for details.

**Withdrawals.** If you decide to drop the class, you must officially withdraw from the course following the specific rules of your college. Please know that students withdrawing from the course will not have any records retained for use upon retaking the course. If you are considering withdrawing from the course for academic reasons, I urge you to come and talk with me during office hours. Your situation may not be as bad as you think it is.

Course Policies

**Appropriate student use of class notes and course material**

Taking notes is a means of recording information and personally absorbing and integrating the educational experience. However, disseminating class notes and materials (including exams, lecture videos, practice exams, worksheets, handouts, etc.) beyond the classroom community and/or accepting compensation for taking and/or distributing class notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see http://policy.umn.edu/education/studentresp.

**Sexual harassment**

“Sexual harassment” means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual’s work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult the Board of Regents policy: http://regents.umn.edu/sites/regents.umn.edu/files/policies/SexHarassment.pdf.

**Late registration**

Please be advised that joining the course after the start of classes does not excuse you from attendance and/or any work collected and/or graded. You should give careful consideration to this prior to late addition (after the first day of classes) to our course.

**Overlapping and back-to-back courses**

Enrolling in overlapping or back-to-back courses that do not allow enough travel time to arrive at class meetings (including exams) on time is prohibited. For more information, see http://policy.umn.edu/education/overlappingclasses.
Mental health and stress management

As a student, you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health website: http://www.mentalhealth.umn.edu.

Student workload expectations per undergraduate credits

For fall and spring semester, one credit represents, for the average University undergraduate student, three hours of academic work per week, averaged over the term, in order to complete the work of the course to achieve an average grade. One credit equals 42-45 hours of work over the course of the term (1 credit x 3 hours of work per week x 14 or 15 weeks in a semester = 42 to 45 hours of academic work. Thus, enrollment for 15 credits in a term represents approximately 45 hours of work per week, on average, over the course of the term.

Student conduct code

As a student at the University you are expected to adhere to Board of Regents Policy: Student Conduct Code. To review the Student Conduct Code, please see: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Equity, diversity, equal opportunity, and affirmative action

The Department of Chemistry is united in the belief that diversity in all of its forms is good. Collaboration among people of all cultures and backgrounds enhances our experience as scientists and contributes to excellence in teaching, learning, and research. We strive to promote a climate that celebrates our differences and strengthens our department by embracing and working to increase our diversity.

The University provides equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf.

Issues with your instructor

On occasion you may have a concern or problem regarding this course. You will find your instructor quite willing to discuss this with you. If, however, you wish to discuss it with someone other than your instructor, please contact Prof. Michelle Driessen, Director of General Chemistry, at mdd@umn.edu. She will serve as a mediator in helping to resolve the issue.

Scholastic dishonesty

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. Please see the Student Conduct Code (http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf) for more information. If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course and may face additional sanctions from the University. For additional information, please see: http://policy.umn.edu/education/instructorresp.

The Office for Community Standards has compiled a useful list of FAQs pertaining to scholastic dishonesty: https://communitystandards.umn.edu/avoid-violations/avoiding-scholastic-dishonesty.

Academic freedom and responsibility

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help: your instructor, the department chair, your academic advisor, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost. See the Board of Regents policy for further information: http://regents.umn.edu/sites/regents.umn.edu/files/policies/Academic_Freedom.pdf.

Use of personal electronic devices in the classroom

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. For complete information, please reference http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.

Disability accommodations

The University of Minnesota views disability as an important aspect of diversity and is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attention, learning, chronic health, sensory, or physical), please contact DRC at (612) 626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with Disability Resource Center and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DRC website, https://diversity.umn.edu/disability/.

Many international students and scholars experience difficulty during their stay in the US, and International Student and Scholar Services (www.isss.umn.edu) office is available to help.

* Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".

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| Chapter 1 | Atoms and Elements  
September 3-6 |
| --- | --- |
| Videos | Chemicals  
Scientific Method  
Atoms  
Elements & the Periodic Table  
Isotopes & Atomic Mass |
| Practice Problems | 6, 9, 10, 12, 13, 15, 17, 21-27, 35, 37, 38, 44, 47, 49, 53, 55, 60 |
| Homework A Due 11:59 pm, September 5 |
| Quizzes: September 6  
Retake: September 9 |

| Chapter 2 | Electrons and the Periodic Table  
September 9-13 |
| --- | --- |
| Videos | Electronic Structure  
Demo – Hydrogen Line Spectrum  
Orbitals  
Electron Configurations & Orbital Diagrams  
Periodic Trends  
Demo – Group Properties  
Ion Formation  
Demo – Rainbow Balloons |
| Practice Problems | 4, 6, 8, 12, 20, 24, 25, 29, 39, 50, 52, 53, 56, 57, 60, 62, 65, 76, 94, 95, 97, 100, 104, 105, 108, 112 |
| Homework B Due 11:59 pm, September 12 |
| Quizzes: September 13  
Retake: September 16 |

| Chapter 3 | Compounds and Chemical Bonds  
September 16-20 |
| --- | --- |
| Videos | Classifying Matter by Composition  
Physical & Chemical Changes & Properties  
Classifying Matter by State  
Lewis Structures of Atoms & Ionic Compounds  
Ionic Compounds  
Covalent Compounds  
Naming Acids  
Molecular View of Elements & Compounds  
Demo – Pure Substances & Compounds |
| Practice Problems | 1, 2, 5-7, 9, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 41, 43, 47, 55, 57, 62, 64, 65, 69, 71, 73, 79, 82, 84, 87, 91, 93-95, 102 |
| Homework C Due 11:59 pm, September 19 |
| Quizzes: September 20  
Retake: September 23 |

| Chapter 4 | How Chemists Use Numbers  
September 23-27 |
| --- | --- |
| Videos | Measurements & Conversions  
Scientific Notation  
Significant Figures  
More Multiples Conversions  
Density |
| Practice Problems | 1, 9, 10, 12, 14, 29, 31, 33, 35, 37, 41, 46-48, 57, 59-61 |
| Homework D Due 11:59 pm, September 26 |
| Quizzes: September 27  
Retake: September 30 |

| Chapter 5 | The Mole and Chemical Formulas  
September 30 – October 4 |
| --- | --- |
| Videos | Counting Atoms by Gram  
Counting Molecules by the Gram  
Chemical Formulas as Conversion Factors  
Mass Percent Composition  
Empirical and Molecular Formulas |
| Practice Problems | 5-12, 16, 19, 20, 23-28, 31, 38, 40, 42-45, 50, 52, 62, 72-75, 81, 82 |
| Homework E Due 11:59 pm, October 3 |
| Quizzes: October 4  
Retake: October 7 |

| Chapter 6 | The Mole and Chemical Formulas  
October 7-11 |
| --- | --- |
| Videos | Lewis Structures of Covalent Compounds  
Exceptions to the Octet Rule  
Lewis Structures of Polyatomic Ions  
Resonance Structures  
VSEPR Theory  
Electronegativity and Polarity  
Intermolecular Forces |
| Practice Problems | 4, 6-8, 17, 18, 29-40, 46, 47, 50-53, 57-64, 66, 68 |
| Homework F Due 11:59 pm, October 10 |
| Quizzes: October 11  
Retake: October 14 |

| Chapter 7 | Solids, Liquids, and Phase Changes  
October 14-18 |
| --- | --- |
| Videos | Physical Changes  
Physical Properties  
Detergent & Fabric Softener  
Melting Point Trends  
Demo – Viscosity & IMF  
Demo – Surface Tension  
Demo – Boiling Water at Room T |
| Practice Problems | 8, 10, 11, 13, 21-23, 31, 34-36 |
| Homework G Due 11:59 pm, October 17 |
| Quizzes: October 18  
Retake: October 21 |

| Chapter 8 | Gases  
October 21-25 |
| --- | --- |
| Videos | Kinetic Molecular Theory  
Pressure  
Ideal Gas Law  
Combined Gas Law  
Demo – Solvent Can (more views)  
Partial Pressure |
| Practice Problems | 7, 8, 10, 27, 28, 32, 33, 35, 36, 39, 40, 44-49, 55, 56, 58, 59 |
| Homework H Due 11:59 pm, October 24 |
| Quizzes: October 25  
Retake: October 28 |

| Chapter 9 | Physical Properties of Solutions  
October 28 – November 1 |
| --- | --- |
| Videos | Solutions  
Solubility and IMF  
Demo – Dissolution of Ionic & Covalent Compounds  
Molarity  
Dilution  
Ion Concentration |
| Practice Problems | 3, 5, 7, 11, 14, 15, 18, 23, 25, 27, 29, 33, 39, 41, 43, 45, 47, 59, 61, 63, 67, 69, 75, 79 |
| Homework I Due 11:59 pm, October 31 |
| Quizzes: November 1  
Retake: November 4 |
### Chapter 10
Chemical Reactions and Chemical Equations  
*November 4-8*

- Videos
  - Chemical Equations & Balancing
  - Solubility
  - Precipitation Reactions
  - Types of Chemical Equations
  - Acid-Base Reactions
  - Gas Evolution Reactions
  - Oxidation-Reduction Reactions
- Demo – Mg and Carbon Dioxide

#### Practice Problems
1, 7, 9, 13, 15, 18, 19, 21, 23, 25, 27, 35, 37, 39, 41, 45, 47, 49, 53, 61, 67

#### Homework J Due 11:59 pm, November 7

#### Quizzes: November 8  
**Retake:** November 11

### Chapter 11
Using Balanced Chemical Equations  
*November 11-15*

- Videos
  - Stoichiometry
  - Limiting Reactants
  - Percent Yield
  - Solution Stoichiometry
  - Stoichiometry & the Ideal Gas Law
  - Enthalpy & Stoichiometry
- Demo – Thermite Reaction
- Demo – Methanol Rockets

#### Practice Problems
1, 3, 5, 7, 9, 11, 13, 15, 19, 21, 23, 27, 29, 31, 33, 35, 41, 43, 47, 49, 55, 61, 67, 73

#### Homework K Due 11:59 pm, November 14

#### Quizzes: November 15  
**Retake:** November 18

### Chapter 12
Acids and Bases  
*November 18-22*

- Videos
  - Acids & Bases Defined
  - Strong vs. Weak Acids & Bases
  - pH & pOH Scales
  - Titrations
  - Buffers
  - pH and Ionic Compounds

#### Practice Problems
1, 9, 11, 13, 15, 21, 23, 25, 31, 33-35, 41, 43, 45, 49, 55, 57, 59, 61, 69, 71, 77, 79

#### Homework L Due 11:59 pm, November 21

#### Quizzes: November 22  
**Retake:** November 25

### Chapter 16
Nuclear Chemistry  
*December 2-6*

- Videos
  - Radioactivity
  - Half-Life
  - Fission

#### Practice Problems
5, 7, 11, 14, 15, 17, 23, 25, 26

#### Homework M Due 11:59 pm, December 5

#### Quizzes: December 6  
**Retake:** December 9

### Final Exam Review
*December 9-11*

#### ALEKS Full Pie Due 11:59 pm, December 11

#### Final Exam: Friday, December 13, 8-10 am