Course Syllabus
Introductory Chemistry 1405 73113

Math, Natural Science & Sports Sciences Learning Center
Division Office: P-330
Phone: 972-273-3500
Hours: Vary by semester so check the posted hours.

This course syllabus is intended as a set of guidelines. NLC and your instructor reserve the right to make modifications as necessary to promote the best education possible within prevailing conditions. If you have questions please check for the answer in ecampus or this Syllabus before you send me an email.

Instructor Information

<table>
<thead>
<tr>
<th>Instructor:</th>
<th>Cynthia Simmons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email:</td>
<td><a href="mailto:csimmons@deccd.edu">csimmons@deccd.edu</a></td>
</tr>
<tr>
<td>Office Phone:</td>
<td>972 273 3483 (best to email me)</td>
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<tr>
<td>Office:</td>
<td>P369 (Main Campus)</td>
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<tr>
<td>Office hours:</td>
<td>Please refer to ecampus for current schedule.</td>
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Course Information

Course title: Introductory Chemistry 1405 North campus
Credit hours: 4 credit hours
Class meeting time: Lecture F 9-11:50 am, at home lab
Course description: This course is for non-science majors and allied health majors. Fundamental concepts are presented in lecture and laboratory including the periodic table, atomic structure, chemical bonding, reactions, stoichiometry, states of matter, properties of metals, nonmetals and compounds, chemical nomenclature, acid-base theory, oxidation-reduction and solutions. Descriptive chemistry is emphasized.
Course prerequisites: Developmental Mathematics 0091 or Developmental Mathematics 0093 or Developmental Mathematics 0098 or Developmental Mathematics 0099 or the equivalent. Developmental Reading 0093 or English as a Second Language (ESOL) 0044 or have met the Texas Success Initiative (TSI) standard in Reading.

Required Textbooks and Materials
• **Textbook:** “Chemistry: An Introduction to General, Organic, and Biological Chemistry,” 12th edition by Timberlake. Prentice Hall

• **Homework System:** Pearson’s Modified Mastering (titled “MyLab & Mastering” on the website.

There are many options for buying the text and homework system. They can be bundled together in a “Value Pack” which includes both the text and the website access code, or they can be purchased separately. The following are ISBNs for the different options.


*If you choose to use an earlier edition of the text let me know.*

• **Lab** – Campus students do not have any lab expenses as the lab manual is available through ecampus. Online students must purchase lab supplies as outlined in Appendix B of this Syllabus.

• **Scientific calculator** – these can be purchased anywhere for as little as $10. Make sure the calculator you use can do log functions and exponents.

• **Access to ecampus** – our class website contains many documents and information such as grades and due dates for exams and labs.

**PROGRAM –LEVEL OBJECTIVES FOR Chemistry 1405**

Chemistry 1405 develops the following objectives from the Texas Higher Education Coordinating Board:

- Communications: Written
- Communications: Visual
- Critical Thinking
- Empirical & Quantitative Skills

**Specific Course Learning Outcomes**

Perform calculations related to topics included in Chemistry 1405.

1. Be able to express, interpret, and utilize relationships between variables
2. Solve problems using complete, thorough setups with metric and SI units, significant figures, and dimensional analysis.
3. Describe the fundamental particles of matter; relate basic laws and theories to their behavior, utilize a systematic method of naming compounds and polyatomic ions.
4. Write and balance different types of chemical equations, and perform stoichiometric calculations including calculations with empirical formulas, limiting reactants, percent yield and molarity.
5. Define energy and heats of reactions, and perform related calculations. Recognize the environmental issues related to energy.
6. Recognize the correlation between electronic structure and the organization of the periodic table. Be able account for periodic trends.
6. Determine the relationship between pressure, volume, moles, and temperature of gases and perform related calculations. Describe the characteristics and behavior of gases, liquids and solids and the intermolecular forces that are involved with these states of matter.

7. Investigate the quantum mechanical model of the atom, write and interpret quantum numbers for the electrons in an atom. Write electronic configurations and show the correlation to chemical properties.

8. Differentiate between ionic and molecular compounds, and write Lewis structures. Utilize the VSEPR theory to predict the shapes and polarities of molecules from the Lewis structures.

9. Define radioactivity, write nuclear reactions, and perform related calculations with half-lives. Recognize the environmental and medical impact of nuclear radiation.

10. Define solution, and explain colligative properties and the process of osmosis. Describe the factors affecting solubility and perform calculations with concentration of solutions.

11. Describe dynamic equilibrium and apply Le Chatelier’s principle. Describe the factors affecting reaction rates.


Course Outline (Calendar)

Please see Appendix A at the end of this syllabus for a complete and detailed Course Outline /Calendar.

Means of Assessment of Course Learning Outcomes

The Course Learning Outcomes are addressed in more detail for each chapter in the Learning Objectives. These outcomes (objectives) will be assessed using methods of testing through departmental exams, in class group work, homework assignments, and written lab reports.

Evaluation Procedures

HOMEWORK – 10%

Problems are assigned and graded.

The “Homework” button in ecampus has details on how to register and enroll in My Lab and Mastering, and the Course ID for the current semester.

Students are strongly encouraged to complete the assignments in preparation for the tests. Homework due dates will be shown in the website. Late homework is worth 50% so do the homework on time. The homework assignments will stay available until the time of the final for studying or completion of late assignments. Homework is closed after the final. Homework completed after the final will NOT be given any credit.
Do NOT wait to begin the homework. Work the assignments a little at a time as we finish the sections. Bring questions to class and we will work the problems. If you click on “show answer” you will receive a grade of zero for that problem so ask for help before you do that.

Once you have completed the homework and the due date has passed, you can still review or rework them in preparation for the exams. Often the problem will provide different numbers when you rework them. As you study, be sure to refer to the Learning Objectives for each chapter. These Learning Objectives will help you prepare for the exams.

Your homework grades are posted on the My Lab and Mastering web site. Your final homework average for the course will be posted in eCampus at the end of the semester.

Note: If you are having trouble getting My Lab and Mastering to accept your multiple choice answer or show the problem, switch browsers or go back to a previous version of your current browser. The problem can also be that you need to update your flash player or enable your JavaScript. Go to the website for details and downloads.

Exams (60% of grade)

The five exams will be multiple choice and will be taken on the computer at the testing center you choose, or in a proctored testing environment. Each exam must be taken by the due date specified in Appendix A. You will log on to eCampus and click on the “Exams” button and select the exam. You may take the exam once the testing center has put in the password. Exam scores will appear immediately upon completion of the exam.

The testing center will provide a copy of the periodic table and scratch paper. You will need to bring a pen or pencil and your scientific calculator to the testing center along with your picture ID. You may use your own programmable calculator if you agree to have the memory cleared before and after the exam. Some testing centers will provide a calculator. Be sure to arrive in plenty of time to take the exam. For more information click the link to the DCCCD Testing Centers. DO NOT take any testing materials with you when you leave the Testing Center. This includes the test, answers, charts, scratch paper. To do so constitutes Academic Dishonesty.

Be sure to check the hours of your testing center particularly if there are changes due to holiday hours, and arrive in plenty of time to take the exam. Do not wait until the last minute since there are long lines, particularly on Saturdays.

Students are NOT allowed to leave the testing center or the classroom during a test and return to complete the test. Visit the rest room before your exam and do not drink a liter of fluid before your exams. Submit requests for special accommodations to the Disability Services Office in person (A430) or by phone at 972-273-3165. Visit the North Lake College Disability Services for more information.
Exams must be taken by the scheduled deadline! Any student who misses a test deadline with an excused absence can only earn a maximum of 70% of the total points. Exams will be cumulative; however, they will focus on more recent material. The final exam will be given during our scheduled time in the classroom. MAKE-UPS: For a missed exam with an excused absence during the testing dates, a make-up exam must be taken as soon as possible at the discretion of the instructor. You will not be allowed under any circumstances to take more than 2 tests during the last week of the semester. Excused absences will only be offered for one of the following reasons: illness, death in family, official University business, or documented emergency.

Lab (30%) Note: Students cannot pass this course with a failing lab grade.

Experiments are scheduled throughout the semester. These experiments will help to reinforce some of the concepts and theories that are studied. The lab grade will be the simple average of all the grades received on the experiments. The grading of the experimental lab reports will be based on their accuracy and completeness. Experiments conducted in campus laboratories are recognized as wet lab experiences. According to the American Chemical Society virtual or simulated labs are not an acceptable substitute for a wet lab experience (ACS Public Policy Statement). Even though you will perform this lab at home, this course uses a “wet” lab experience with actual chemicals and equipment. Lab reports are collected according to the Lab Schedule in Appendix A. They will be graded on a 100 point basis:

- Quiz – 20 pts.

The following are guidelines for what is considered ACADEMIC DISHONESTY on Lab Reports. (See also “Institutional Policies” section below.)

- No falsification of data. Do not “fudge” or “tweak” in any way in order to improve your results.
- Do your own work. No sharing of data, that is, you may not copy data from someone else or give someone else your data.
- No plagiarism. Students must submit their own independent Lab Reports and cannot use someone else’s report as your own. If you work with a partner your data may be the same as your partners but you must answer questions, perform calculations, and write the conclusions on your own. If the instructor suspects any dishonesty on the part of the students, those students will receive a zero on the lab report.

If the instructor suspects any dishonesty on the part of the students, those students will receive a zero on the lab report. Second cheating offenses may result in failure of the total chemistry lab.

Grading Scale

The grades will be based on the following distribution:
Four Exams 60%  
Homework 10%  
Lab 30%  

A = 90-100  
B = 80-89  
C = 70-79  
D = 60-69  
F = 0-59  

Use the following formula to calculate your grade:

\[
\text{Grade} = (\text{Exam Av x 0.60}) + (\text{Hwk Av x 0.10}) + (\text{Lab Av x 0.30})
\]

Please **do not beg** for grades; you earn them.

Please **do not ask for extra credit**. We already have extra credit in the homework as well as bonus questions on each exam.

**Discipline/ Course/ Department/Policies**

**Attendance**
- Attendance is **mandatory**. Attendance is taken each class period.
- **Students are responsible for all materials handed out and all announcements made during their absence regardless of the reason(s) of the absence.**
- Excused absences will only be offered for one of the following reasons: illness, death in family, official University business, or documented emergency. For any excused absence written documentation is required. To obtain an excused absence, email or call by the next class period. Documentation should be brought to the next class meeting.

**Classroom Policies**
- You are encouraged to ask questions and to participate in class discussions. You are expected to be an active learner.
- You must bring your calculator, pencil and paper to class. These are the ONLY materials required in class.
- No cell phones or beeping devices allowed. No open lap tops.
- Distractive talking or any disorderly conduct is prohibited. Please be courteous of others.
- Model citizenship and collegiate attitude are expected from all students as outlined in the Code of Student Conduct.
- **Students are encouraged to go to the Science Learning Center.**
- Please **include course and section number in the subject line**. For example: Chem 1405 73426.

**SCIENCE LEARNING CENTER**
The Science Learning Center (P333) provides free tutorial services for North Lake science students. The center features tutors, software, videos, CDROM’s, internet, models, places to study quietly, places for group work, and other materials to assist in science classes. In order to access resources of the center a North Lake College ID Card is required. The subject specific schedule of tutors is updated every semester and is
Institutional Policies

ACADEMIC DISHONESTY
The Student Code of Conduct prohibits academic dishonesty and prescribes penalties for violations. According to this code, which is printed in the college catalog, "academic dishonesty", includes (but is not limited to) cheating, fabrication, facilitating academic dishonesty, plagiarism, and collusion.

1) The Vice-President of Academic & Student Affairs may initiate disciplinary proceedings against a student accused of academic dishonesty.
2) Academic dishonesty includes, but is not limited to, cheating on a test, plagiarism and collusion.
3) Cheating on a test includes:
   a) Copying from another student’s test paper;
   b) Using, during a test, materials not authorized by the person giving the test;
   c) Collaborating with another student during a test without permission to do so.
   d) Knowingly using, buying, selling, stealing, transporting, or soliciting in whole or part the contents of an un-administered test.
   e) Substituting for another student, or permitting another student to substitute for you to take a test; and
   f) Bribing another person to obtain an un-administered test or information about an un-administered test.
4) “Plagiarism” means the appropriation of another’s work (ideas and/or words) and the unacknowledged incorporation of that work in one’s written work offered for credit. Quotes not identified as quotes constitute a form of plagiarism even if the borrowed ideas are documented.
5) “Collusion” means an unauthorized collaboration with another person in preparing written work offered for credit.

Academic dishonesty may result in the following sanctions, including, but not limited to:
1. A grade of zero or a lowered grade on the assignment or course.
2. A reprimand.
3. Suspension from the college.

NOTIFICATION OF ABSENCE DUE TO RELIGIOUS HOLY DAY(S)
Students who will be absent from class for the observance of a religious holiday must notify the instructor in advance. Please refer to the Student Obligations section of the college catalog for more explanation. You are required to complete any assignments or take any examinations missed as a result of the absence within the time frame specified by your instructor.

REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT
North Lake College provides academic accommodations to students with disabilities, as defined under ADA law. It is the student's choice and responsibility to initiate any request for accommodations. If you are a student with a disability who requires such ADA accommodations, please contact North Lake College's Disability Services Office in person (A430) or by phone at 972-273-3165. View more information by going to North Lake College Disability Services.

DROP POLICY
If you are unable to complete this course, you must officially withdraw by the date stated on the academic calendar. Withdrawing is a formal procedure which you must initiate; your instructor cannot do it for you. There are important additional factors which are affected by withdrawals. See the categories below for additional information. It is strongly encouraged that a student speaks with the instructor before withdrawing. If a student stops attending class and does
not officially withdraw, that student will receive a performance grade based on work completed and missed. For more details concerning withdrawals go online to **Dropping or Withdrawing from Classes**.

All Dallas County Community Colleges charge a higher tuition rate to students registering the third time for a course. This rule applies to the majority of credit and Continuing Education / Workforce Training courses. Developmental Studies and some other courses are not charged a higher tuition rate. Third attempts include courses taken at any DCCCD college since the fall 2002 semester. For further information, go online to **Third Attempt at DCCCD**.

**ADMINISTRATIVE WITHDRAWAL**

Students with valid extenuating circumstances may be eligible for an administrative withdrawal by the Dean of the Division in which the course or courses are taught. An administrative withdrawal will not be awarded to students who simply fail to withdraw prior to the last day to receive a “W.” The request for an administrative withdrawal must be made in writing to the Dean of the Division with any supporting documentation attached. This must occur before the last official day of the semester.

**FINANCIAL AID STATEMENT**

Students who are receiving any form of financial aid should check with the Financial Aid Office prior to withdrawing from classes. Withdrawals may affect your eligibility to receive further aid and could cause you to be in a position of repayment for the current semester. Students who fail to attend or participate are also subject to this policy.

To apply for financial aid in the DCCCD, students must complete FAFSA (Free Application for Federal Student Aid) on the web at **FAFSA**.

**STOP BEFORE YOU DROP**

For students who enrolled in college level courses for the first time in the fall of 2007, Texas Education Code 51.907 limits the number of courses a student may drop. You may drop no more than 6 courses during your entire undergraduate career unless the drop qualifies as an exception. Your campus counseling/advising center will give you more information on the allowable exceptions. Remember that once you have accumulated 6 non-exempt drops, you cannot drop any other courses with a “W”. Therefore, please exercise caution when dropping courses in any Texas public institution of higher learning, including all seven of the Dallas County Community Colleges. For more information, you may access: **eConnect Facts About Dropping Classes**.

**COUNSELING SERVICES**

Counseling services for personal issues are provided to all students currently enrolled at North Lake College at NO CHARGE. These services are provided by or supervised by licensed professionals who are bound by confidentiality (within ethical parameters). With the assistance of a counselor, students are able to identify, understand, resolve issues and develop appropriate skills.

To make an appointment call 972-273-3333 or go to A 311.

For additional information go to: [http://northlakecollege.edu/services-and-resources/health-and-wellness/counseling-services/Pages/default.aspx](http://northlakecollege.edu/services-and-resources/health-and-wellness/counseling-services/Pages/default.aspx)

**THE ACADEMIC SKILLS CENTER (ACS)**

The ASC is designed to provide assistance to students in the following areas:

- Labs for students enrolled in foreign language, Developmental Reading, and ESOL courses. One-on-one tutoring is available.
- The Writing Center can help students clarify writing tasks, understand instructors’ requirements, develop and organize papers, explore revision options, detect grammar and punctuation errors, and properly use and document sources. Rather than merely editing or “fixing” papers, tutors focus on helping students develop and improve their writing skills.
- The Online Writing Lab (OWL) allows students to submit papers to our writing tutors electronically and get feedback within 24-72 hours. The OWL can be accessed through eCampus. After logging on to eCampus, click on the Community Tab at the top. Type “Owl” in the search field and click “Go.” Next, click on the double drop-down arrows next to “NLC-OWL2,” and then click on “Enroll.” Once enrolled,
students can receive services from the OWL. For more information or to schedule a tutoring appointment, come by A-332 or call 972-273-3089

**State-Outcomes Core Curriculum**

As part of the core, this course contributes to the development of six basic Program Level Outcomes. These Outcomes are essential to the learning process in any discipline and are defined by the Texas Higher Education Coordinating Board.

This course reinforces Program Level Outcome 1 with written and visual communications, Program Level Outcome 2, 3, and 4.

**Program-Level Outcome 1: Communication Skills** - to include effective development, interpretation and expression of ideas through written, oral and visual communication

1. **Written**: Process and produce effective written communication adapted to audience, purpose, and time constraints.
2. **Oral**: Produce effective oral communication adapted to audience, purpose, and time constraints.
3. **Visual**: Effectively interpret visual images or produce effective visual images.
4. **Listening**: Comprehend, and analyze oral information.

**Program-Level Outcome 2: Critical Thinking Skills** - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

**Program-Level Outcome 3: Empirical and Quantitative Skills** - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

**Program-Level Outcome 4: Teamwork** - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

**Program-Level Outcome 5: Personal Responsibility** - to include the ability to connect choices, actions and consequences to ethical decision-making

**Program-Level Outcome 6: Social Responsibility** - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

**Learning Activities, Outcomes, and Assessment**

The following table shows how the Course Outcomes reflect the State Outcomes and are incorporated and assessed in the course.

<table>
<thead>
<tr>
<th>CHEM 1405</th>
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<tbody>
<tr>
<td><strong>1. Students will determine the correct number of significant figures in an image of a metric ruler with 70% proficiency on departmental exams.</strong></td>
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</table>

**Program Level Outcome 1.3**

2. **Students will predict the relative atomic sizes of two elements based on their position in the Periodic Table at 75% proficiency on departmental exams.**

**Program Level Outcomes 2 and 3**

3. **Students will use specific heat to calculate heat loss or gain, temperature change, or mass of a sample at 70% proficiency on departmental exams.**

**Program Level Outcomes 2 and 3**
Appendix A: Exam, Lecture and Lab Schedule

Last day to withdraw can be found on NLC website under “Catalogues and Schedules”
Click on the “Academic Calendar” link
April 16

<table>
<thead>
<tr>
<th>Exam</th>
<th>Chapters</th>
<th>Due Date</th>
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<tr>
<td>1</td>
<td>1,2,3</td>
<td>Feb 13</td>
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<tr>
<td>2</td>
<td>4,5</td>
<td>Mar 6</td>
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<tr>
<td>3</td>
<td>6,7.1-7.2</td>
<td>Mar 20</td>
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<tr>
<td>4</td>
<td>7,8</td>
<td>Apr 7</td>
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<tr>
<td>5</td>
<td>9,10</td>
<td>May 8</td>
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<tr>
<td>6</td>
<td>1-10</td>
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(Original Final)

<table>
<thead>
<tr>
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<tr>
<td>1</td>
<td>1/23</td>
<td>1</td>
<td>Chemistry</td>
</tr>
<tr>
<td>2</td>
<td>1/30</td>
<td>2</td>
<td>Chemistry and Measurement</td>
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<tr>
<td>3</td>
<td>2/6</td>
<td>3</td>
<td>Matter and Energy</td>
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<tr>
<td>4</td>
<td>2/13</td>
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<tr>
<td>5</td>
<td>2/20</td>
<td>4</td>
<td>Atoms and Elements</td>
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<td>6</td>
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<tr>
<td>7</td>
<td>3/6</td>
<td>5</td>
<td>Nuclear Chemistry</td>
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<tr>
<td>8</td>
<td>3/13</td>
<td>6</td>
<td>Ionic and Molecular Compounds</td>
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<td>10</td>
<td>3/27</td>
<td>7</td>
<td>Chemical Quantities and Reactions</td>
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<tr>
<td>1</td>
<td>1/23</td>
<td>Lab Introduction – read Syllabus</td>
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<td>2</td>
<td>1/30</td>
<td>Safety Training – read documents in ecampus</td>
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<td>Measurement Lab</td>
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<td>4</td>
<td>2/13</td>
<td>Measurement and Significant Figures</td>
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<td>Separation of a Mixture</td>
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<td>7</td>
<td>3/6</td>
<td>Spring Break</td>
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<td>8</td>
<td>3/13</td>
<td>Naming Chemical Compounds</td>
<td>Chem Rxns and Eqns</td>
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<td>9</td>
<td>3/20</td>
<td>Cont.</td>
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<td>10</td>
<td>3/27</td>
<td>Chemical Reactions and Equations</td>
<td>Stoic.</td>
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<tr>
<td>11</td>
<td>4/3</td>
<td>Stoichiometry of a precipitation reaction</td>
<td>RR and E</td>
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<tr>
<td>12</td>
<td>4/7</td>
<td>Reaction Rates and Equilibrium</td>
<td>Gas Laws</td>
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<tr>
<td>13</td>
<td>4/20</td>
<td>Gas Laws</td>
<td>Coll. Props</td>
</tr>
<tr>
<td>15</td>
<td>5/3</td>
<td>pH and Titration</td>
<td></td>
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</tbody>
</table>
Appendix B: CHEM 1405 online Lab Materials

Below is a list of supplies needed for your CHEM 1405 online lab. Order these as soon as possible from the websites listed. These supplies cannot be bought from the bookstore, Home Depot, Wal-Mart or any other store I know of. They are chemicals and must be shipped ground so order today.

You may choose to work with ONE partner which will reduce the expense of your lab as well as make the lab more fun to do. One set of supplies is sufficient per lab group of two.

If you work with a partner please be aware that you are required to submit your own original lab report. Your data and your partner’s data will be the same but you must answer any questions in your own words, otherwise it is plagiarism. Please inform me of who your partner is. (See Academic Dishonesty above.)

1. **North Lake College Chemistry 1405 Kit, SK-NLC1405:** ~$80 from the following website: [Home Training Tools website](#)

2. **Balance:** ~$8 from the following website: [Amazon-balance](#)

3. **Supplemental supply kit from NLC:** In addition to the above equipment, you need an additional supply kit which NLC will provide. *NLC is the only place you can procure this supplemental supply kit.* This additional kit will contain:

   1. **Metal cylinder** – approximately ¼ inch diameter by 1 inch length.
   2. **unknown liquid** for density determination
   3. **shrinky dink rectangle**
   4. **Ziploc bag** containing 2g unknown mixture sample (sand, salt, iron)
   5. **2 filter papers**
   6. **plastic weigh boat**
The NLC supplemental lab kit contents fit into a sandwich baggie and can be mailed in a normal sized envelope.

4. The following list is also needed to perform these labs. The chemicals and materials on this list are available at grocery stores, drug stores, hardware stores, etc. You very likely already have many of these in your home and kitchen.

- Ruler
- magnet -refrigerator is fine
- hot pads
- cookie sheet
- distilled water
- styrofoam cups
- coffee mug
- clock with second hand/timer
- sink or large pot for water bath
- ice
- graph paper
- vinegar
- sugar
- table salt (NaCl)
- baking soda (sodium bicarbonate, NaHCO₃)
- magnesium sulfate (Epsom salts, MgSO₄•7H₂O)
- vegetable oil
- celery stalk
- toothpick
- red cabbage
- lemon juice

At the end of the semester please consider donating any left-over supplies or chemicals that you no longer need or want. We will put them to good use.
Kit Contents

- 250 & 600 ml glass beakers
- 250 ml Erlenmeyer flask
- wickless alcohol lamp and stand *(you’ll need to provide denatured alcohol as fuel)*
- 10 ml polypropylene graduated cylinder
- 100 ml polypropylene graduated cylinder
- 4 Test tubes, large 16x150 mm
- test tube stand
- test tube clamp
- 12” thermometer
- Funnel, plastic, 65 mm dia.
- tubing pinch clamp
- Tube, 2 pack, 5 mm glass, 3” long
- Tubing, 4.8 mm vinyl, 2’ long
- Rubber stopper, #6.5, 2-hole
- Rubber stopper, #0, 1-hole
- pH papers
- Pipet (medicine dropper)
- Stirring rod, glass, 6” long
- hydrochloric acid, 30 mL
- magnesium ribbon, 60 cm
- copper II sulfate, CuSO₄, 30g
- copper II chloride, CuCl₂, 30g
- iron III chloride, FeCl₃, 30g
- phenolphthalein solution, 30mL
- ammonium nitrate, NH₄NO₃, 30g
- Zinc, metal electrode, 4”
- Copper metal electrode, 4”

*Home Training tools website*