

Syllabus CHE 107 – Fall 2015

General Chemistry Laboratory I

Meeting Times and Locations:

Labs meet in LSC 002, 004, and 008 (Ground floor of the Life Sciences Complex). Please check your myslice.syr.edu account for the meeting time and location of your section.

Instructors:

Gary Bonomo, 012A Life Sciences Complex
Email: gbonomo@syr.edu; Phone: (315) 443-7500
Office Hours: To Be Announced; also available by appointment

Dr. Deborah Kerwood, NMR Facility, 0-222 Center for Science and Technology
Email: djkerwoo@syr.edu; Phone: (315) 443-5925.
Office Hours: Available to meet by appointment

Head Teaching Assistant: Evelyn Myint - Email: nmyint@syr.edu

Registration and Scheduling Questions:

April LePage, 1-014 Center for Science and Technology, Email: amlepage@syr.edu, Phone: (315) 443-4109

Teaching Assistant Office Hours:

A copy of the Office Hours schedule is on Blackboard for students. Students are encouraged to attend *any* Teaching Assistants Offices Hours... they are *not* limited to their own Teaching Assistant's time slot.

Laboratory Manual:

“General Chemistry Laboratory & Notebook Using Biochemical Tools” by Philip N. Borer, Kendall/Hunt Publishing Company, will be available at the SU Bookstore. ***Bring the manual to every meeting*** of the lab. **Some labs are hand-outs.**

Preparation and Punctuality:

Your success in each experiment will be influenced by your pre-lab preparation. Read the lab description and steps before you arrive in lab. Lab sessions begin promptly with important information concerning the procedures and safety considerations. If you arrive late, the TA may decide not to let you in for that lab session. Please turn in your assignments as soon as you arrive.

Schedule:

Week of August 31 to September 4 – NO CHE 107 LAB CLASS

Week of September 7 to September 11 – NO CHE 107 LAB CLASS

Week of September 14 to September 18

- Lab 01a: For Your Safety (*Safety Quiz is a course requirement, but does not count towards final grade*)
- Lab 01b: Cross-Linking Polyvinyl Alcohol with Sodium Borate

Week of September 21 to September 25

- Lab 02: Chemical Formulas and Reactions

Week of September 28 to October 2

- Lab 03: Preparation and Viscosity of Biodiesel from Vegetable Oil

Week of October 5 to October 9

- Lab 04: Acetic Acid Content of Vinegar

Week of October 12 to October 16

- Lab 05a: Chemistry of Recycling Aluminum
- Lab 05b: Synthesis of Alum from Clay

Week of October 19 to October 23

- Lab 06: Enthalpy of Neutralization

Week of October 26 to October 30

- Lab 07: Issues in Water Quality

Week of November 2 to November 6

- Lab 08: Separation and Qualitative Analysis of Cations [*Handout*]

Week of November 9 to November 13

- Lab 09: Molecular Modeling [*Handout*]

*Please also read **Atomic and Molecular Structure** in the manual as reference material*

Week of November 16 to November 20

- Lab 10: Determination of the Concentration of a Protein [*Handout*]

Week of November 23 to November 27 – NO CHE 107 LAB CLASS [*Thanksgiving*]

Week of November 30 to December 4

- Lab 11: Generating Hydrogen Gas

Week of December 7 to December 11

- *Cumulative Assessment*

Learning Outcomes: The Learning Outcomes (1-9) listed below are further specified by the key points as they apply to this course. Upon completion of this course, students will be able to do the following:

1. *Develop problem solving skills*

- A. Determine which experimental method can be used to measure a given quality or quantity.

2. *Perform accurate and precise quantitative measurements*

- A. Apply the experimental technique of titration to acid-base chemistry and water hardness analysis.
B. Determine heat and enthalpy using calorimetry.
C. Explain the difference between a qualitative and quantitative experiment.

3. *Interpret experimental results and draw reasonable conclusions*

- A. Perform dimensional analysis and unit conversion. Specifically this refers to applying these concepts to moles, mass, volume, and concentration.
B. Determine the correct number of significant digits for a value calculated from lab data.

4. *Analyze data statistically and access reliability of results*

- A. Perform basic statistical and experimental analysis calculation. Specifically this includes: percent error, percent yield, average, and standard deviation.

5. *Anticipate, recognize, and respond properly to hazards of chemical manipulation*

- A. Apply the safety standards outlined in *Lab 01a: For Your Safety*. This specifically includes: familiarizing oneself with the safety hazards and required protection before laboratory work, following safety rules during laboratory work, and maintaining a clean work space and equipment.

6. *Work effectively in small groups and teams*

- A. Operate in a laboratory group of two to three; contributing approximately equally to task performed. This includes performing lab techniques correctly, as well as being prepared and punctual.

7. *Training in ethical behavior*

- A. Apply the standards of ethical behavior outlined in the *Syracuse University Academic Integrity Policy*.

8. *Develop laboratory skills in chemical and instrumental methods of analysis*

- A. Determine how to prepare a solution from stock reagents.
B. Balance chemical reactions and utilize stoichiometric ratios to determine limiting reactants.
C. Determine the concentration of a solution using UV/vis spectrophotometry.
D. Describe the basic principles of atomic structure, molecular structure, and ionic compounds.
E. Apply the basic principles of the combined gas law and molar volume of a gas.

9. *Learn about the impact of chemistry on society*

- A. Apply the Twelve Principles of Green Chemistry.***

*** These are a standard used by many professional scientific organizations to describe the term "Green Chemistry." They are described in detail in their original source, which is the book *Green Chemistry: Theory and Practice* by Paul T. Anastas and John C. Warner. However, a good summary can be found on the American Chemical Society (ACS) website:

<http://www.acs.org/content/acs/en/greenchemistry/what-is-green-chemistry/principles/12-principles-of-green-chemistry.html>

Safety in the Lab is Essential:

Please review the material covered in the *For Your Safety Lab*, and follow the requirements in the *Conditions for Safe Participation in the Chemistry Laboratory*. The *Safety Quiz* must also be completed with a score of 100% as a requirement for the course. There is also a *Safety Contract* to be signed on the first day of lab.

- Wear approved safety goggles. Contact lenses are not permitted.
- Turn off cell phones and store personal items in the appropriate location.
- Know the location and operation of safety equipment (emergency exit, eyewash stations, safety showers, fire extinguishers, fire blankets, fire alarms and emergency telephones).
- Wear appropriate attire (no shorts or short skirts, no open-toe shoes or loose clothing).
- Be prepared by reading the experiment prior to class.
- Do not rush an experiment or be careless in the lab.
- Never eat or drink in the laboratory.
- Never work alone in the laboratory.
- Only work on the assigned experiment.
- Use a fume hood when instructed.
- Check the labels before dispensing chemicals and inform instructor of any contamination.
- Inform instructor/TA of spills, splashes, injuries or any dangerous situations.
- Avoid touching hot objects and hazardous chemicals.
- Check Material Safety Data Sheets to be familiar with chemical hazards and precautions.
- Properly dispose of waste materials.
- Cleanup your workspace and wash your hands prior to leaving the laboratory.

Grading: This is a one credit Laboratory Course that is independent of the lecture CHE 106 with a separate instructor and grading. However, it does reinforce and supplement the lecture materials.

30% Pre-Lab Quizzes (Blackboard)

55% Post-Lab Reports

10% Lab Technique

5% Cumulative Assessment

Grade Scale: (your score will be rounded to the nearest whole number)

A $S \geq 95$

A- $90 \leq S < 95$

B+ $85 \leq S < 90$

B $81 \leq S < 85$

B- $78 \leq S < 81$

C+ $74 \leq S < 78$

C $69 \leq S < 74$

C- $64 \leq S < 69$

D $55 \leq S < 64$

F $S < 55$

Weighted Total on Blackboard:

Your score so far. Only counts grades that have been entered.

IMPORTANT: Check Blackboard and your SU email several times per week for Announcements. Your TA will record your grades to Blackboard – check them for accuracy when your graded papers are returned.

Blackboard Pre-Lab Quizzes:

Pre-Lab Quizzes are on blackboard.syr.edu and will be available for up to **one hour prior** to lab time. If you do not take the quiz on time, a zero grade for that quiz will be recorded. **Study the experiment before taking the quiz; you only get one attempt at it.** As a best practice, do not wait until the last minute to take the quiz in order to avoid potential login problems. Contact your instructor or TA with any issues. Pre-Lab Quizzes must be done individually, but reference to the lab manual and notes is allowed.

Please Note: Even for an absence due to extenuating circumstances (see “Absence” section), Pre-Lab Quizzes are still due at their normal time. The only exception is in the case of an extended absence.

Lab Notes and Post-Lab Reports:

Carefully record your observations and data for all experiments. **Your TA must sign your notes and check the equipment you used for that session before you leave lab.** Lab Report sheets are in the manual and handout labs are obtained from your instructor. The graded reports make up 60% of your grade. Lab reports will include a Data Section and questions to be answered. **The lab reports must be turned in at the beginning of the next lab period. A deduction of 5 points will be made for reports one day late, with an additional 5 points deduction for each subsequent day. (However, assignments later than one week after it is due receive a grade of zero).** For example, a grade of 90 would become a grade of 80 if the lab report was two days late $90 - (5 \times 2) = 80$. You will be assigned a workstation and a partner at the first lab class. Experiments are done with a partner. Each student should keep his/her own records and write an individual lab report. At their discretion, TAs may assign a grade of zero to identical lab reports.

Please Note: For an absence due to extenuating circumstances (see “Absence” section), your Post-Lab Report is due within one day of your absence. The only exception is in the case of an extended absence.

Lab Technique:

This grade will be determined by your TA based on his/her observation of your laboratory technique, preparedness, punctuality, attention to safety and cleanup of lab space. A rubric will be provided for you.

Cumulative Assessment:

This Cumulative Assessment is a written examination that occurs on last scheduled lab class in your normal lab room; you have the entire lab section to complete it. There are 32 multiple choice questions based upon the Learning Outcomes outlined earlier in the syllabus. Each question is targeted toward assessing if you mastered a specific key point under the Learning Outcomes; there are two questions per key point.

You should bring number 2 pencils and know your SUID number and lab section number, as you will need these to fill out the answer sheet. You are allowed to bring a calculator (scientific or graphing), however you may not have any reference materials saved on the device. You will be provided with a periodic table, the only other reference material you will be allowed is a double-sided note sheet (8.5” x 11”). Your note sheet must be handwritten and prepared by you; you cannot use a photocopy or typed sheet.

You may not discuss the questions on this Cumulative Assessment with other students!

Disability Related Accommodations

If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), <http://disabilityservices.syr.edu>, located at 804 University Avenue, room 309, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented disabilities “Accommodation Authorization Letters” as appropriate. As accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

Academic Integrity

Complete academic honesty is expected of all students. Please review the Syracuse University Academic Integrity Policy (http://supolicies.syr.edu/ethics/acad_integrity.htm). Any incidence of academic dishonesty (i.e. plagiarism, cheating) will result in both course sanctions and formal notification to the Associate Dean of Undergraduate Affairs of the College of Arts and Sciences and to the corresponding Dean of your own College, if you are not an A&S student. In this course, students are allowed to work/study together, but quizzes and lab reports must represent the work of the individual student.

Students will receive an *Academic Integrity Agreement* to sign on the first day of lab. This specifies that they are aware of this policy and reiterates that they will abide by it.

Absence

You are expected to attend every lab class; a missed lab will count the Post-Lab Report for that lab as a grade of zero. Extenuating circumstances exist that provide exceptions to this policy; which are outlined below. If you believe that you have an extenuating circumstances not covered under this list, please contact your Instructor to see if this constitutes an exception to the policy. **For all forms of extenuating circumstances, proper documentation is required and any missed work must be completed.**

In the case of an extended absence (more than a day), please contact the Dean's office in your college: 315-443-9396 for Arts & Sciences 315-443-3604 for Engineering

Religious Observances

The Religious Observances Policy (http://supolicies.syr.edu/emp_ben/religious_observance.htm) at Syracuse University recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. **Students will have access to an online notification form through MySlice for two weeks beginning the first day of class.** Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance provided they notify their instructors before the end of the second week of classes.

Student Athletes

If you will miss a lab due to conflicts with game schedules, etc., **you and your coach or athletic advisor have to contact your Instructor before the date when the conflict occurs.**

Serious Illness:

If you will miss a lab session due to illness or injury, you must provide a note from the Health Center or your private physician to your Instructor. **The note must explicitly say that you are unable to attend the lab class;** a note that says that you visited the Health Center or your private physician is not sufficient.

Death in the Family:

You must receive a **note from your Dean's Office** documenting this.

Schedule Completion of Missed Work

This is only allowed due to extenuating circumstances; see "Absence" above. Contact your Instructor to complete missed work. There are two possible options, which are listed below. *You have one week from the makeup lab or receiving the data set to complete the Post-Lab Report (or else it is a grade of zero).*

- Attend a different lab section during the same week as the absence. Instructor approval is required be scheduled ***before*** attending lab sessions.
- Complete the Post-Lab Report using an Instructor provided data set. This is subject to Instructor approval, and is ***only allowed if attending a different lab session during the same week is impossible.***