

CHEM 111 Syllabus

General Chemistry Laboratory A

Summer 2018
Loyola University Chicago

Laboratory Coordinator: Michael Farley
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Welcome to CHEM 111.

Required Items

- CHEM 111 Laboratory Packet (provided)
- Safety goggles (provided). If you wish to provide your own goggles, they must be type G, H or K goggles and must meet or exceed ANSI Z87.1 requirements; safety glasses do not meet our requirements.
- Laboratory coat
- Scientific calculator
- Non-erasable pen is required for all written work. No pencil. No white out is allowed.

Grading Scale	
% total	Grade
> 94%	A
90-94%	A-
87-90%	B+
84-87%	B
80-84%	B-
77-80%	C+
74-77%	C
70-74%	C-
65-70%	D+
60-65%	D
< 60%	F

If unintentional errors are discovered, the instructor reserves the right to revise the syllabus as necessary including, but not limited to: schedule, assignments, and point values.

General Policies

- Your written work, as well as TA observations, will serve as the basis for earning points and informing me of your progress. Written work will be graded with an emphasis on correct use of significant digits, consistency of results (do data and observations match conclusions?), appropriateness and correctness of analysis, and thoroughness in responses.
- All work is to be completed in non-erasable pen. This includes data sheets, all homework assignments, and exams. Any work not completed in pen or contains “white-out” is subject to a point deduction and is not eligible for any regrade requests.
- Completed written work will be stored in a lab folder. Each week your teaching assistant will distribute your folder to your assigned seat. These folders will serve as a way for your TAs to collect/ return your work, as well as, to be an entire catalog of work completed throughout the semester. All graded assignments should remain inside of your lab folder. You may take the contents of your folder home before an exam in order to study, but everything must be returned when the exam is complete.
 - If there are any discrepancies in the scores submitted by your TA to me, your proof of having earned a specific grade on a particular lab is the presence of that graded lab in your lab folder at the end of the semester.
- Each student will be assigned a drawer with glassware and equipment. At the beginning of the semester, the drawer contents will be checked for completeness. The drawer may be shared with other students over the course of a week, and therefore, it is essential that you clean the equipment used after an experiment is completed. The drawers may be checked sporadically. If glassware is broken, the student is responsible for requesting a replacement item; there is no penalty for broken glassware. At the end of the semester, the drawer will be checked out again for completeness.
- Two exams covering basic skills and comprehension will be given. In part, a laboratory exam requires a student to demonstrate knowledge and skills by performing tasks in the laboratory. In this way, a student’s ability to use equipment properly and demonstrate correct technique can be evaluated. An exam will also cover basic understanding of the fundamental models of chemistry illustrated in the laboratory experiments.
You may use your own graded data sheets, lab manual, syllabus, pre-lab lectures and tutorials from CHEM 111 on the practical quizzes.
- Safety and Clean-up points will be awarded on the basis of safe/professional conduct in the lab. A safe lab environment is essential, and unsafe actions will definitely result in grade degradation. The following is a partial list of ways you can lose safety/clean-up points:
 - Coming late to class, after the pre-lab lecture has started will result in deductions of your safety points.
 - Not dressing appropriately for lab.
 - Not bringing goggles to lab/ not wearing your goggles consistently in lab can result in expulsion from the lab. Safety glasses do not meet our safety requirements.
 - Not keeping your equipment drawer in good condition (i.e. dirty glassware).
 - Not adhering to Disposal Instructions indicated in each lab handout.
 - The lab-pro equipment used is breakable, and requires special care. You and your partner will be assigned a box to use, and if the equipment is found to have been handled negligently, points will be deducted from both your safety points and your lab score.

Attendance

Attendance is mandatory. You are not allowed to make up a quiz or a lab in another section of CHEM 111; you may only attend sessions for sections in which you are enrolled. There is a point value associated with the work accomplished in each class, and you will not be able to earn points for classes that you do not attend.

If the university is open, you are expected to attend class and to be on time. Points will be deducted from those who arrive late. If you arrive after the conclusion of the pre-lab lecture, you will not be allowed to perform the lab.

Students must make information concerning time conflicts with University sponsored events available to the instructor at the beginning of the semester.

Missing 2 of the labs is a significant portion of work and will result in academic failure, as will missing 1 or both of the Practical Quizzes. Please look at the schedule at the end of this syllabus and consider the negative impact that missing one of the hands on laboratory sessions will have on your educational experience, including your performance on the Practical Quizzes. It is in your best interests to register for a section that does not conflict with other obligations. Students should not enroll in a lab section that they cannot fully attend.

If you miss a lab, contact your primary Laboratory Coordinator immediately.

Please request sample data for that lab. Sample data is data similar to what you may have obtained in lab and may help you study for Quizzes. (Sample data is not the Virtual Lab.) You will be responsible for understanding the missed material, and **normal deadlines will apply for completing homework and pre-lab quizzes on Sakai.** For graphs and homework where a hard copy is required, please turn the assignment into your Primary Laboratory Coordinator, with a note requesting full credit due to your absence the prior lab session.

If you miss a lab, you may complete a 20 point Virtual Lab Assignment one time over the course of the semester. This assignment is done online and is intended to replace an absence in lab which is **unavoidable and for a significantly important reason.** You may not use it to replace a poor lab score or homework score. **The due date/time for the Virtual Lab assignment can be found on the schedule at the end of the syllabus, and is the same for all sections.** Please turn a hard copy of the assignment to the Instructor directly or drop it off in the department office (Flanner 125) and ask that it be put into instructor's mailbox with verification of the date and time turned in. Do not submit the assignment via email. Directions for this assignment can be found at the end of the Lab Manual, and direct any questions you have to your instructor, not your TA. If you complete the virtual lab, you will not receive any feedback on it until the end of the semester.

Students who are not concurrently enrolled in, or have not completed General Chemistry 101 or 105 with a grade of C- or better will be removed from the class. Students wanting to drop lecture after midterm may stay in the co-req lab only if midterm grade, posted in LOCUS, is a D or better. Students should continue to attend lecture until the week of the drop date to gain as much background knowledge as possible. Students wishing to drop lecture, and have a mid-term grade of D or better, can seek assistance from the Department of Chemistry and Biochemistry office (Flanner 125). Students with a midterm grade of F must drop the co-req lab along with the lecture; no exceptions.

Educational Goal

In this general chemistry laboratory course, my purpose as your chemistry instructor is to provide a hands on introduction to experimental methods of scientific investigation in chemistry. The fundamental models of chemistry discussed in lecture will provide the basis for understanding the experimental laboratory work. Each lab will provide a practical opportunity for you to gain competence with the basic techniques of lab work and the practical experience necessary to understand its significance. It is my wish that this laboratory experience will encourage students who are seeking intellectual challenges along with an understanding of the chemical principles in the laboratory.

Conducting experiments and collecting data to test the validity of theories and models requires a different set of skills that those required for success in the lecture part of a general chemistry course. During a laboratory activity, each student's hands, mind, eyes, as well as other senses are focused on the task at hand. Success in the lab involves skills in making perceptive qualitative observations and accurate quantitative measurements.

With each laboratory experiment, I intend to pose relevant questions, and along with TAs, to help each student to execute a laboratory approach which will yield reliable data related to these questions. Each student is required to obtain data and to depend upon this data when answers to these questions are drafted. Each lab will be structured enough so that you should not feel lost or confused, but not so structured that you will find it unnecessary to think for yourself.

Course Objectives

IDEA: Individual Development and Educational Assessment

Objective 1: Learning to apply course materials (to improve thinking, problem solving, and decisions)

- Understand and apply proper labeling to include a value, units, and chemical identity, as well as pertinent stoichiometry and other relevant calculations.
- Understand and apply the rules for obtaining the correct number of significant figures with analysis of personally taken data.
- Execution and analysis of results.
- Analysis and understanding of the meaning of percent relative error.
- Understanding the creating graphs and the meaning of graphs.
- Understanding and analysis of the result of errors in the procedure execution.

Objective 3: Gaining factual knowledge (terminology, classifications, methods, trends).

- Competent recording of observations.
- Produce correct Net Ionic Equations and understand their meaning.
- Use best practices with balances.
- Competent use of volumetric glassware.
- Proficient use of burets.

Regarding Sakai and Technical Difficulties

It is *strongly encouraged* that all required submissions to Sakai as well as writing lab reports, opening course/data/experiment files, be done on a reliable wired internet connection [not wireless], that of which the University itself provides in the Information Commons and various computer labs on the Lake Shore Campus.

Under NO circumstances will excuses of “technical difficulties” be accepted as this syllabus is stating all students should use a wired internet University computer [not wireless internet] to submit work in Sakai, write lab reports, open course/data/experiment files. This list is not exhaustive and it should be noted that any activities this course may require a computer or internet connection for should be completed using University computers with wired internet connection. Use of home internet [wired or wireless], University wireless, or public wireless is at your, the student’s, own risk. It is not prohibited but as Instructor has stated in this syllabus, Instructor is not responsible for technical difficulties of non-University devices [cell phone, tablet, home/work/public wireless internet or computer]. Do not submit items in Sakai using a cell phone or a tablet device as these do not count as reliable internet connection tools.”

Role of Teaching Assistants

In each lab session, your primary interaction could be with a Teaching Assistant. The function of a TA is to help you get good data in a safe fashion, and to provide individual help on each lab when necessary. The role of the Laboratory Coordinator is more behind the scenes: to plan the curriculum, prepare both handouts and powerpoints, and to train the TAs so that the lab experience is educational, fair, and effectively run for students enrolled in all of the sections. Please know that the Instructor is available to you if there are any questions or concerns that the TAs cannot handle appropriately. Each TA will keep office hours as well, and are posted on Sakai.

Academic Integrity

We wish to make it clear that the standard of academic integrity and personal honesty delineated in the College of Arts & Sciences [Statement on Academic Integrity](#) is expected of every student and will be enforced. Details can be found at http://www.luc.edu/cas/faculty_resources.shtml

Cheating can take many forms in lab, but the most common form is to copy data and answers to analysis questions, or to share files for homework. The data and analysis as well as the homework you submit for marking must be your own, and if it is not, no credit will be awarded for the entire lab, nor will make-ups be granted. Additionally, findings of dishonest academic behavior are reported to the Chair of the Department of Chemistry and Biochemistry and to the Dean’s Office, which are then subject to review and entered into an individual’s record. A copied answer or report will result in penalty for all students involved.

Disabilities Accommodations

If you have a documented disability and wish to discuss academic accommodations, please see your primary Laboratory Coordinator by the second meeting of lab. (The Coordinator of Services for Students with Disabilities is located in the Sullivan Center for Student Services, Suite 260, 508-7714, and must be contacted independently.)

Tutoring

The Tutoring Center is offering free walk-in tutoring in Biology, Chemistry, Math, Physics, and Statistics. To see a full schedule of times, or to find more information on tutoring services, visit the Tutoring Center online at www.luc.edu/tutoring.

Lost and Found

Any items mistakenly left in lab will be taken to the Chemistry Department office, 125 Flanner Hall, and can be identified and claimed there. **Please put your name on your data sheets, lab manuals, calculators, notebooks, and other personal items.**

Safety in the Laboratory

Laboratory Safety is everyone's responsibility. By registering for and participating in this course you agree to abide by the following rules. Failure to follow these rules constitutes grounds for withdrawing the offending student from the lab session and or course at any time with no opportunity for make-ups.

1. To wear approved safety goggles and a lab coat at all times in the laboratory.
2. To know both the location of and how to use eye washes.
3. Not to wear contacts in the laboratory.
4. To wear appropriate clothing that minimizes potential chemical contact with your skin. Shoes that adequately cover the entire foot are required. Sandals, open-toes shoes, perforated shoes, open-backed shoes are not acceptable. No skin should be exposed on your feet or legs, so clothing that covers and protects your body from the waist down (including your ankles) should be worn. You must be dressed appropriately to perform an experiment, including your lab coat.
5. To know both the location of and how to use the safety showers.
6. To know both the location of and how to use the fire extinguishers.
7. Not to perform unauthorized and unknown experiments, nor work in the lab without appropriate supervision.
8. Not to take chemicals or equipment out of the laboratory.
9. Not to engage in horseplay or any clowning around that might endanger you or other students.
10. Not to eat, drink, chew gum, or smoke anything in the laboratory at any time.
11. No headsets or cell phones.
12. To keep your lab space clean and tidy.
13. To ask your instructor or TA when in doubt about procedures. Inform your Instructor of any health condition you have that might affect your performance or safety in the laboratory.

By using common sense and following these rules, it is unlikely that you or your classmates will be involved in or injured in a mishap in the laboratory.

While it is very important that you do your part to prevent an accident from occurring, it is just as important to know what to do if someone is injured.

Critical Injuries include: glass in his/her eye(s), serious cuts, severe chemical burns, severe fire burns, seizures.

Immediately call for help using either the lab phone (security number is taped to phone handle) or the emergency phone in the hallway directly outside the laboratory. Anyone with chemicals or foreign objects in his/her eye(s) will be escorted to the Wellness Center or to the hospital.

First Aid Basics

- Minor Cuts: Clean the wound, remove foreign material. Band-Aids are available. (Two Band-Aid rule: If you bleed through one Band-Aid, another should be applied over the first Band-Aid. If you bleed through two Band-Aids in a few minutes, you will be escorted to Health Services). Additionally, if there is any possibility of broken glass in a cut, you will be escorted to the Wellness Center.
- Minor Burns from Fire: Immerse affected area in ice water.
- Chemicals in Eyes: Immediately flush eyes with water at the eye wash. Continue with flush for at least 10 minutes. You will probably need to hold the affected eye(s) open to do this properly.
- Chemicals on Skin: Rinse affected area with water immediately at the sink or safety shower. If clothing is affected, remove clothes before rinsing! Continue with rinse for at least 10 minutes.

Fire Hazards

The primary heat source in this laboratory is the Bunsen burner, which is fueled by natural gas. A lit Bunsen burner is a small, controllable fire, but the heat generated by the burner fire can be quite hazardous in certain circumstances. It can serve as an ignition source for other combustible materials in the lab such as paper (lab handouts, paper towels, filter paper, etc.), plastics (wash bottle), flammable liquids (acetone, ethanol). A burner fire can also ignite clothing and hair. Proper operation of a burner and the absence of combustible materials in the proximity of the burner will significantly reduce the risk of a fire. Each lab is equipped with a fire extinguisher, fire blanket, and safety shower, which should be used in a fire emergency.

Procedure in a case of a fire:

Remain calm; alert the instructor and your immediate neighbors.

Personal safety, yours and others in the labs, is always the top priority.

A small fire in a small container can be suffocated by covering it with a watch glass or inverted beaker.

With a somewhat larger fire, you need to decide whether or not you think you can control it with a fire extinguisher.

Use of a Fire Extinguisher

Located by the doors in both labs; a back-up fire extinguisher is located at the west end of the floor.

Maintain an escape position; i.e. stay between the fire and the doorway.

Break the plastic ring, pull out the metal ring, release the hose from the bracket, direct the hose at the base of the flames, and press the lever down.

Note: the fire extinguishers are heavy and not particularly easy to direct. These are multi-purpose dry chemical extinguishers, safe for anything we use in lab.

CHEM 111 Point Breakdown		
Introduction to Data Analysis (SF)	lab	10
Lab 1: Reactions of Reagents with Ordinary Materials	lab	20
Intro Accuracy Homework	sakai	5
Accuracy and Precision Pre-lab quiz	sakai	3
Lab 2: Accuracy and Precision	lab	20
Accuracy and Precision Graph	manual	5
Accuracy and Precision Sakai Homework	sakai	5
Mass Relationships Pre-lab quiz	sakai	3
Lab 3: Mass Relationships	lab	20
Mass Relationships % Composition Homework	manual	5
Mass Relationships Discussion Forum	sakai	4
Mass Relationships Post Discussion Quiz	sakai	1
Vitamin C Pre-lab quiz	sakai	3
Lab 4: Determination of Vitamin C Content in Juice	lab	20
Deductive Chemical Reasoning Pre-lab quiz	sakai	3
Lab 5: Deductive Chemical Reasoning	lab	20
Deductive Chemical Reasoning Discussion Forum	sakai	4
Deductive Chemical Reasoning Post-Discussion Quiz	sakai	1
Estimating Avogadro's Number Pre-lab quiz	sakai	3
Lab 6: Estimating Avogadro's Number	lab	20
Estimating Avogadro's Number Discussion Forum	sakai	4
Energy Relationships Pre-lab quiz	sakai	3
Lab 7: Energy Relationships	lab	20
Lab 7: Energy Relationships - Energy Diagram	manual	5
Spectrophotometric Analysis of Aspirin Pre-lab quiz	sakai	3
Lab 8: Spectrophotometric Analysis of Aspirin	lab	20
Synthesis of Aspirin Homework	manual	5
Lab 9: Percent Hydrogen Peroxide in Dental Whiteners	lab	10
Practical Exam 1	lab	40
Practical Exam 2	lab	40
Safety	lab	10
Clean-up	lab	20
Check out	lab	10
	Total	365

MAY 2018

SUN	MON	TUE	WED	THU	FRI	SAT
20	21	22	23	24	25	26
		Lab 1: Ordinary Materials		Lab 2: Accuracy and Precision		
27	28	29	30	31		
		Lab 3: Mass Relationships		Lab 4: Vitamin C		

JUN 2018

SUN	MON	TUE	WED	THU	FRI	SAT
					01	02
03	04	05	06	07	08	09
		Practical Exam #1		Lab 5: Deductive Chemistry		
10	11	12	13	14	15	16
		Lab 6: Avogadro's Number		Lab 7: Energy Relationships		
17	18	19	20	21	22	23
		Lab 8: Analysis of Aspirin		Practical Exam #2	Last day to withdraw without penalty grade of "WF"; midnight	
24	25	26	27	28	29	30
		Lab 9: Dental Whiteners		Check-out		