

FCH151 General Chemistry Lab I

Faculty Instructor: Dr. Neal M. Abrams
Office: 422 Jahn
E-mail: nmabrams@esf.edu
Phone: 470-4723
Office hours: T 12:30 – 1:50 p
W 10:35 – 11:30 a
or by appointment

Lab coordinator: Ms. Kate Bailie
Office: 419 Jahn
E-mail: kmbaile@esf.edu
Phone: 470-4811

Description of the course

Three hours of laboratory per week. Basic laboratory techniques will be emphasized through experiments dealing with the density of solids and liquids, atomic ratios and mass combining ratios, atomic structure and the periodic table, calorimetry, chemical reactivity, geometric structure of molecules, formation of coordination compounds, and paper chromatography. Co-requisite: FCH 150.

First and foremost, chemistry is an experimental science. All the material that you have learned and will learn in the classroom has resulted from innumerable experiments in the laboratory. These experiments may be synthetic or theoretical, take place in the field or in front of a computer. Regardless of the format, the results from these experiments begin to explain the world around us. It is in this sense that you travel into the lab following in the footsteps of famous chemists like Millikan, Curie, and Pasteur, making discoveries of your own. Remember, be careful, be safe, and write everything down. You never know where it might take you.

Course learning outcomes

After completing the course, students should be able to:

1. Practice the manipulation of chemical materials in a personally safe and environmentally responsible manner.
2. Understand how to carry out basic chemical measurements for both qualitative and quantitative purposes.
3. Apply the broad principles of chemical reactivity, the structure of molecular compounds, and the stoichiometric requirements of chemical reactions.
4. Produce and analyze data, interpret the information, and effectively communicate the results of analysis.

Program learning outcomes

- Integrate a sound understanding of the fundamental chemical principles and underlying theories in the core areas of chemistry with an emphasis on critical thinking and problem-solving.
- Practice hands-on skills and apply knowledge of safe practices in the experimental and instrumental aspects of chemistry through laboratory course experience.
- Demonstrate competency in the scientific “tools” required for the successful practice of chemistry: math, statistics, computer applications and information technology.
- Develop an understanding of the interdisciplinary connections between chemistry and other disciplines.

College learning outcomes

- Scientific reasoning: Students will be able to demonstrate understanding of modern science and the implications of scientific discoveries, apply the scientific method, and use science to address contemporary problems.
- Quantitative reasoning: Students will be able to effectively describe, interpret, apply, and evaluate quantitative information.
- Technological and information literacy: Students will be able to: use critical thinking skills to determine the information needed to solve a problem, access information using appropriate technologies, and effectively and appropriately use information to accomplish a specific purpose.
- Critical thinking: Students will be able to: identify, analyze, evaluate, and develop well-reasoned arguments.

Textbooks and supplies

Course-specific materials and supplies are provided through the laboratory course fee assessed at the start of each semester. This includes a laboratory manual, laboratory notebook, and safety glasses. All students are also required to have a scientific calculator (graphing not required) and a pen.

Grading

Critical thinking skills are essential in the general chemistry lab. The following criteria are used to promote and assess critical thinking:

1. Information acquisition: Identify and differentiate questions, problems, and background statements.
2. Application: Assess the suitability of various methods of reasoning and confirmation when approaching a problem. Develop hypotheses and support or negate them based on available information.
3. Analysis: Identify and analyze assumptions and use logical reasoning to evaluate results.
4. Synthesis: Formulate questions and problems, construct arguments to address those questions, and effectively communicate conclusions through written and oral discourse.
5. Communication: In instances of alternative points of view, criticize or defend arguments with the use of logical reasoning and evidence.
6. Evaluation: Assess the quality of available data to draw reasonable conclusions.

Lab assignments

- All written lab assignments have a specified due date, typically one week after completion of the lab experiment, unless specified otherwise. Late lab reports will be assessed a penalty of 15% per day.

Pre-laboratory assignments

- Most pre-laboratory assignments (prelabs) can be referenced in the lab manual, but will be submitted on Blackboard before lab. Since the prelabs will often assist you in running the lab, you are encouraged to keep notes on your calculations so they can be used as a reference during lab. Pre-laboratory assignments must be submitted prior to the beginning of your normally scheduled lab session. If a lab is made up before the normally scheduled lab, prelabs need to be handed in at that time (i.e. a Tuesday pre-makeup for a Thursday lab).
 - Late prelab assignments will not be accepted.
 - You may not be allowed to participate in lab if your prelab assignment is not complete.

Note: No grades will be dropped. The class-wide postlab average will be used as a deduction to the total point report grade allocation for the semester. Since this number cannot be predicted ahead of time, assume your earned grade is your final grade but may be higher.

All work has an assigned point value by section; pre-laboratory assignments, reports & post-laboratory assignments, and instructor evaluation. The points will be summed and divided by the total number of points available. Because each section has a different point allocation per assessed item, the sections generally have the following overall weight in determining the final grade:

Break down for the final lab grade:	Prelab assignments =	20 %
	Postlab and lab reports =	70 %
	General TA evaluation =	10 %
	Total =	100 %

For example, the total points for the report section may total 800. If you receive a total of 680 points, that would be equivalent to an 85. There should be no surprises in determining your grade throughout the course as all assignment grades are posted in the FCH.151.Merged.Fall2018 section on Blackboard.

Grading Scale

A	A ⁻	B ⁺	B	B ⁻	C ⁺	C	C ⁻	D	F
(93 – 100)	(90 – 92)	(87 – 89)	(83 – 86)	(80 – 82)	(77 – 79)	(73 – 76)	(70 – 72)	(60 – 69)	(≤ 59)

Course schedule

The laboratory meets one time per week for up to three hours. There will be a few large class recitations that will occur immediately following the Friday meeting of the General Chemistry lecture, FCH150. Recitation meetings will be announced during the semester.

Section	Day	Time	Room
Section 1	Monday	9:30 – 12:20 PM	130 Jahn
Section 5	Monday	3:45 – 6:35 PM	130 Jahn
Section 6	Tuesday	8:00 – 10:50 AM	138 Jahn
Section 7	Tuesday	12:30 - 3:20 PM	130 Jahn
Section 8	Tuesday	3:30 – 6:20 PM	130 Jahn
Section 14	Tuesday	5:30 – 8:20 PM	138 Jahn
Section 9	Wednesday	9:30 – 12:20 PM	130/138 Jahn
Section 11	Wednesday	3:45 – 6:35 PM	138 Jahn
Section 12	Thursday	8:00- 10:50 AM	130/138 Jahn
Section 13	Thursday	12:30 - 3:20 PM	130 Jahn
Section 3	Thursday	3:30 – 6:20 PM	130 Jahn
Section 10	Thursday	5:00 – 7:50 PM	138 Jahn
Recitation	Friday (as announced)	3:20 – 4:20 PM	Marshall auditorium

Attendance policy

Attendance at your scheduled lab session each week is mandatory. The laboratory begins on time, and it is therefore imperative that you show up on time. We recommend that you show up 5 minutes early so you can place materials in your locker, turn in reports and prelabs, and get your equipment ready to begin the experiment. If you are late to lab, it at the discretion of the instructors whether or not you can participate in lab. If you must miss a lab, you may be allowed to reschedule by permission of the lab instructor, Dr. Abrams. You must make it up before the end of the week during another lab session. Labs run Monday – Thursday, typically three times per day. A missed lab will result in zero (0) for that lab report. Because lab is a hands-on course, there are no “dry lab” reports (you cannot obtain data from someone else). Valid excuses for requesting a makeup lab is limited to illness, family emergency, or religious observance. There are no excused absences. More than two absences will result in an automatic failure or incomplete grade for the course.

Lab Makeup Procedure

It is your responsibility to contact your TA and Dr. Abrams about making up a lab session. Unless contacted first, you will not be permitted to participate in a makeup lab. See the Course Schedule above and on Blackboard for a listing of rooms and times. Once Dr. Abrams approves your rescheduled lab, you will be permitted to makeup the lab. You will be a guest in this lab section, so the TA will assign you a drawer, locker, and lab partner. You will need to access your safety glasses before starting the lab. In the event that a satisfactory time cannot be found, Dr. Abrams may make other accommodations.

Students with learning and physical disabilities

SUNY-ESF works with the Office of Disability Services (ODS) at Syracuse University, who is responsible for coordinating disability-related accommodations. Students can contact ODS at 804 University Avenue-Room 309, 315-443-4498 to schedule an appointment and discuss their needs and the process for requesting accommodations. Students may also contact the ESF Office of Student Affairs, 110 Bray Hall, 315-470-6660 for assistance with the process. To learn more about ODS, visit <http://disabilityservices.syr.edu>. Authorized accommodation forms must be in the instructor's possession one week prior to any anticipated accommodation. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible.

Academic Integrity

During the laboratory period, you will frequently work with other students in gathering and exchanging data. Sharing of information and discussion of this data with your lab partner and TAs is encouraged in the course. All submitted and graded material, however, must be your own independent work and in your own words. A lab report reflects your own understanding of the material. Academic integrity is taken very seriously in this course. Any instances of cheating or plagiarism will be brought to the attention of the instructor and may result in an immediate zero for the lab. The offense will also be documented and Student Affairs will be notified. Egregious cases of cheating may result in failure of the course and expulsion from ESF.

By registering for courses at ESF you acknowledge your awareness of the ESF Code of Student Conduct (<http://www.esf.edu/students/handbook/StudentHB.05.pdf>), in particular academic dishonesty includes but is not limited to plagiarism and cheating, and other forms of academic misconduct. The Academic Integrity Handbook contains further information and guidance (<http://www.esf.edu/students/integrity/>). Infractions of the academic integrity code may lead to academic penalties as per the ESF Grading Policy.

Diversity and inclusion

As an institution, we embrace inclusive excellence and the strengths of a diverse and inclusive community. During classroom discussions, we may be challenged by ideas different from our lived experiences and cultures. Understanding individual differences and broader social differences will deepen our understanding of each other and the world around us. In this course, all people (including but not limited to, people of all races, ethnicities, sexual orientation, gender, gender identity and expression, students undergoing transition, religions, ages, abilities, socioeconomic backgrounds, veteran status, regions and nationalities, intellectual perspectives and political persuasion) are strongly encouraged to respectfully share their unique perspectives and experiences. This statement is intended to help cultivate a respectful environment, and it should not be used in a way that limits expression or restricts academic freedom at ESF.

The link between lab experiments and concepts from lecture

In lecture, you will learn about the theories and principles of chemistry, but sometimes it is too easy to forget about the “real world”. The laboratory experiments chosen for this course have been specifically designed and placed into this course so that they enhance learning and deepen the understanding of concepts presented in lecture. Wherever possible, experiments have been chosen that exemplify how chemists learn about the world around them through measurement, analysis, and observation.

Teaching assistants (TAs)

Teaching assistants work along with the course instructor as a team to deliver this course to you. The teaching assistants are comprised of both graduate students and sometimes upper-level undergraduates here at ESF. All TAs receive the same training and are held to the highest of standards. The primary role of a TA is to supervise the laboratory sections by demonstrating laboratory skills, providing guidance during laboratories, grading, and holding office hours. Contact information for each TA will be posted at the beginning of the laboratory course on Blackboard. Since all of the laboratory TAs are skilled and knowledgeable in all aspects of the lab course, you are encouraged to attend any of the office hours that suit your schedule. Lecture TAs in FCH150 concentrate on lecture material, so we suggest that you seek out a lab TA with questions related to the lab.

Lab support

Reagent and materials preparation is provided by the General Chemistry Support Coordinator, Ms. Kate. Ms. Bailie is oftentimes in the lab and happy to assist with any immediate technical issues, but please direct all course-related questions to the TAs.

Technology

We use several pieces of technology to bring this course to you. Blackboard is the largest component as it is a repository for your grades and all course related information, including all assignments. We also use cloud services (Dropbox or GoogleDocs) to facilitate data-sharing among sections, YouTube videos on several lab techniques, and QR codes to access several online resources. The QR codes can be read on any smartphone with a free reader app. Note: Success in this course DOES NOT require you to have a smartphone or other fancy gadgets, but you will need access to email and a computer. Email is the primary means of communicating messages to the hundreds of students in this course, so be sure you check your syr.edu email address or forward emails from this course to another email address of your choice.

Civility

Please be respectful at all times towards your classmates and instructors. Treat others as you wish to be treated and behave as you would in a professional setting. The lab is a shared learning environment and respect is as important as the science. If you encounter a conflict in the course, please bring it to the attention of Dr. Abrams or a Teaching Assistant. We will do what we can to mitigate the situation. Do not let conflicts manifest themselves in the lab.

When sending emails, write courteous and grammatically correct messages. Your instructors reserve the right to request a rewrite before writing a reply.

Tips for Success (modified with permission from EFB 101).

It is our hope that every student in this class will be successful. There are a number of resources available to you that will help you be successful.

- Dr. Abrams, along with graduate teaching assistants, will be supervising your work in the laboratory. We all hold regular office hours. Stop by for a visit and get to know us and don't hesitate to regularly attend office hours for out-of-class assistance. Feel free to set up an appointment outside of our regular office hours if they conflict with your class schedule.
- If you anticipate conflicts or academic difficulties, please see one of us at your earliest convenience in order to avoid severe problems further down the line.
- Read your textbook and lab manual often, regularly, and repeatedly. Ideally you should read assignments PRIOR to lab in order to prepare for the information we will be covering.
- Find a study partner or group to discuss classroom and laboratory materials. Share and compare notes. Teach one another.
- Come prepared to participate in laboratory. ASK QUESTIONS!

Assigned work areas

Each student in the General Chemistry lab is assigned a bench drawer for his or her use during the semester. Students in many different sections use these bench drawers, so it is your responsibility to keep glassware and materials clean. If any glassware breaks or items are missing, it is your responsibility to contact the TA immediately. Also notify a TA if you repeatedly find dirty glassware or trash in your drawer.

Hood and balance

Each student is assigned a specific hood and balance area to use for the duration of the semester. The numbers on the hoods and balances correspond to your assigned bench drawer. It is your responsibility to properly maintain the hoods during your lab session by keeping the area clean and uncluttered.

Hallway Locker

Benches and floor space must be kept clear in the lab at all times. To assist with this, each student is assigned a locker in the hallway on the first floor of Jahn. The locker assignment and combination can be found on the inner right side of your bench drawer. All superfluous materials should be stored in these lockers during your session. This includes coats, backpacks, and books. Larger items may be stored in a separate designated area. You cannot store materials on the floor in the lab as this poses a safety hazard. Materials must be removed from the lockers at the end of the laboratory section.

Cleanup procedures

It is your responsibility to clean up any items used during your lab session. This includes capping reagents as well as cleaning glassware, benches, balances, and hoods. Almost all of the materials and items used in the lab are for community use, so please be kind to your peers!

Required materials

- 1) Lab manual – This is what you are reading right now. The lab experiments have been assembled as a complete laboratory manual and will last the entire semester.
- 2) Safety glasses – We provide you with approved safety glasses. These glasses must be worn during all experimental laboratories while the lab is in progress. Only an instructor has the authority to let you know if your safety glasses can be removed.
- 3) Lab notebook – A proper chemistry lab notebook is required for use during lab. We provide you a 100-page carbonless copy lab notebook from Hayden-McNeil that should last the entire academic year.
- 4) Calculator – You should supply your own calculator for use during lab. It must be either a scientific or graphing style.
- 5) Pen – Since all work in your lab notebook is to be written in pen, please bring a ballpoint pen, blue or black ink, with you for every lab.

Fall 2018 Course Outline

(subject to modification)

Week	Date	Lab Experiment
1	Aug 27 – 31	NO LABS
2	Sept 3 – 7	Lab Explorations Safety quiz Monday labs do not meet
3	Sept 10 – 14	EXP #1 – Recycling by separation and recovery
4	Sept 17 – 21	EXP #2 – Chemical analysis of food dyes
5	Sept 24 – 28	EXP #3 – Light, color and atomic emission
6	Oct 1 – 5	EXP #4 – Solar cells from natural dyes
7	Oct 8 – 12	EXP #5 – Limestone analysis
8	Oct 15 – 19	EXP #6 – Limiting reactants
9	Oct 22 – 26	EXP #7 – Conductivity in solution
10	Oct 29 – Nov 2	EXP #8 – Recycling of aluminum
11	Nov 5 – 9	EXP #9 – Nitrates in water
12	Nov 12 – 16	Lab competency certification
13	Nov 19 – 23	NO CLASS – (Thanksgiving Recess)
14	Nov 26 – 30	EXP #10 – Gases and ocean acidification Experiment #9 final report due
15	Dec 3 – 7	EXP #11 – The energy in food and fuels

