Syllabus for CHM 1: Chemistry for Health Sciences I
Fall 2022

Credits: 4- Two lecture hours, one recitation period and a three-hour laboratory period per week.

Course Description: A one-semester course in chemistry for nursing and health sciences consists of lecture, discussion and problem solving, and a laboratory period each week. The laboratory work is an integral part of the course and you are expected to be able to utilize the laboratory experience to answer some exam questions.

Pre-requisites: None. A student is expected to have a working knowledge of algebra.

Required for: This course is pre-requisite for Nursing, Public Health, Exercise Science and Respiratory care. This course fulfills the four-credit laboratory science core curriculum graduation requirement. This course is NOT open to majors in Biochemistry, Bioinformatics or Biology.

Course Outcomes: The student will learn-

- The basic principles of chemistry, including general, organic and biological chemistry.
- The application of basic chemical principles to environment and health.

Course Goals: This course addresses the following Institutional Learning Goals-

- Critical inquiry and analysis
- Quantitative and scientific reasoning
- Informational and technological literacies

Breakdown of Course Hours: 270 Hours Total

	Hrs		**Hrs**
Lecture and Recitation- 3 hrs/week – 15 weeks	45	Laboratory Experiment -3 hrs/week – 15 weeks	45
Lecture Readings	30	Laboratory readings	30
Review Problems	30	Prelab Assignments	30
Exam Preparation	30	Preparation of Laboratory Report	30

Attendance Policy: As per Page 19 of the Academic Bulletin

University Policies and Information:

LIU's Academic Affairs policies: https://liu.edu/about/LIU-policy/policy-by-category-listing
LIU Academic Catalogs: https://liu.edu/enrollment-services/registration/academic-catalogs
The LU Academic Calendar: https://liu.edu/enrollment-services/registration/academic-calendar

Criteria for Evaluation:

- **In-Class Exams: 50%** - There will be 4 in-class exams, with the lowest exam grade dropped. Each exam is worth 20%.
- **Reports: 20%** -Reports will not be accepted for missed labs and penalties will be assessed for more than one absence from lab.
- **Prelab: 10% -** Prelab is due at the beginning of each lab session.
- **Final Examination: 20%**

Final course grades will be based on the total number of points accumulated based on a maximum of 100 points as described above:

A	**A-**	**B+**	**B**	**B-**	**C+**	**C**	**C-**	**D**	**F**
91 ≤	*90-88*	*87-85*	*84-81*	*80-78*	*77-75*	*74-71*	*70-68*	*67-58*	*> 58*

LIU Student Support Services
LIU BROOKLYN

Students with Disabilities:

In compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, including changes made by the ADA Amendments Act of 2008, I will make accommodations for students with disabilities. It is necessary for those students to provide me with the appropriate DSS Accommodations Form by the end of the second week of classes. Please contact the office of Disability Support Services in The Learning Center at 516-299-3057 or by emailing Post-learningcenter@liu.edu to take appropriate steps to develop an appropriate educational plan.

If you are a student with a documented disability, medical condition, or think you may have a disability, and will need accommodations, academic adjustments, auxiliary aids, or other services, please contact the Office of Disability Support Services by calling 516-299-3057 or emailing Post-learningcenter@liu.edu to request services, accommodations or for additional information. Additional information is also available on the DSS website: www.liu.edu/post/dss.

The Learning Center: LIU Brooklyn offers free tutoring in math, sciences and other subject areas as well as reading/writing. For information about how to register for tutoring, contact:

Email: Bkln-LearningSupport@liu.edu
Phone: 718-488-1040
Location: The Learning Center, Library 4th Floor (LLC 405)

The Writing Center: Location: The Learning Center, Library 4th Floor (LLC 405)

If you have any questions, please email us at Bkln-wcenter@liu.edu or contact the associate director, Lynn Hassan (Lynn.Hassan@liu.edu), 718-488-1095.

The Writing Center at Brooklyn provides free writing assistance to all students. Writing assistants can work with you at any point in your writing process from helping to clarify an assignment or prompt, through brainstorming, organizing and developing your ideas, citing your sources, and polishing your writing.

To access information about our location and hours of operation, as well as links to writing resources:

1) click on the Community tab in Blackboard,
2) then click on Writing Center,
3) enroll to join the Blackboard Writing Center organization using the enrollment code: WritingCenter,
4) then select Brooklyn Writing Center or visit us online: wcentersite.wixsite.com/wc-online.
5) Follow us on Instagram for information and updates: @brooklynwc

Brooklyn Healthy Living: www.liu.edu/brooklyn/healthyliving

Long Island University students have access to on-campus mental health counseling services, religious and spiritual counseling, health and wellness programs, and telehealth and local in-person health care.

LIU Healthy Living is a collaboration of on-campus resources and relationships with local health organizations and professionals, including Northwell Health College Behavioral Health Program, the LIU Brooklyn Psychological Services Center, and Northwell Health – GoHealth.

The Psychological Services Center provides confidential counseling to currently enrolled Brooklyn students. Counseling sessions are conducted by appointment only and can be requested via email.

Psychological Services Center
Website: www.liu.edu/brooklyn/healthy-living/mental-health-counseling
Location: Pratt Building 5th Floor
Email: bkln-psychservices@liu.edu

Outline of Course: Lecture

Textbook: "General, Organic and Biological Chemistry: An Integrated Approach", 4th Edition, by Kenneth W. Raymond, John Wiley and Sons, 2014.

Week	Chapter	Topic
1	CH 1: Science and Measurements	The scientific method, matter and energy, units of measurement, scientific notation, the International System of units and metric units, conversion factors, density, specific gravity and specific heat and measurements.
2	CH 2: Atoms and Elements.	Overview of atoms and elements, atomic structure, the periodic table, the mole concept, electron configuration and chemical properties of elements, radioactivity and radioactive isotopes in medicine
3	CH 3: Compounds	Ions, ionic compounds, covalent bonds and molecules, formula weight, molecular weight and molar mass
4		***Test 1: Chapters 1, 2, 3***
5	CH 4: Introduction to Organic Compounds	Structural formulas, polar covalent bonds, molecular shape and polarity, noncovalent interactions, organic functional groups
6	CH 5: Chemical Reactions	Writing chemical equations, reaction types, reactions involving water, oxidation-reduction, mole and mass relationships in reactions, determining yield in reactions, free energy and reaction rates.
7	CH 6: Gases, Solutions, Colloids and Suspensions	Properties of gases, the gas laws, partial pressure, solutions, precipitation, solubility of gases in water, organic and biological compounds, concentration, dilution, colloids and suspensions, diffusion and osmosis
8		***Test 2: Chapters 4, 5, 6***
9	CH 7: Acids, Bases and Equilibrium	Overview of acids and bases, equilibrium reactions, ionization of water, the pH scale, acid-base strength and neutralization, effect of pH on acid and conjugate base concentrations, buffers, factors affecting blood pH
10	CH 8: Organic Reactions Part I	Properties and chemical reactions for hydrocarbons, properties and reactions for organic acids and phenols, preparation and properties of esters, amines as weak bases, amides.
11	CH 9: Organic Reactions Part II.	Properties and preparation of alcohols and ethers, properties of aldehydes and ketones, oxidation of aldehydes, reduction of aldehydes and ketones, reactions of alcohols, aldehydes and ketones.
12		***Test 3: Chapters 7, 8, 9***
13	CH 10: Carbohydrates	Description of stereoisomerism and monosaccharides, reactions of monosaccharides and their different forms, properties of disaccharides, oligosaccharides and polysaccharides.
	CH 11: Lipids and Membranes	Description of lipid classes: fatty acids, waxes, triglycerides, phospholipids, glycolipids, steroids and eicosanoids; description and properties of membranes
14	CH 12: Peptides, Proteins and Enzymes	Description of amino acids, the peptide bond, peptides, proteins, protein structure, denaturation, enzymes and regulation of enzyme catalyzed reactions.
15		***Test 4, Chapters 10, 11, 12***

You should keep up to date on reading and practice problem assignments. You should be able to do the questions and problems at the end of each section within chapters and additional questions and problems at the end of each chapter. The answers to odd numbered questions and problems are given at the end of the book. You should read through the preface of the book to help you with better understanding. You should ask questions in

class when you do not understand some of the material.

There is a series of video tapes (*The World of Chemistry*) available in the video section of the library that may be helpful in understanding the material covered in this course. These tapes can be borrowed from the library or viewed in the media center.

Some Useful Web sites on nutrition and health:

http://www.westonaprice.org/ - a valuable site for information on sensible nutrition, esp. fats
www.nal.usda.gov/fnic/foodcomp - food composition tables
http://www.altmedicine.com/ - alternative medicine information
http://nutrition.about.com/health/nutrition/library/blmicronutrients.htm - info on micronutrients
http://www.eatright.org/ - Amer. Dietetic Assoc. supplement guidelines
http://www.health.harvard.edu/ - Harvard Univ. health publications
http://www.nhlbi.nih.gov/about/framingham/index.html
http://www.nal.usda.gov/fnic/etext/000015.html - Food Nutrition Info Center on supplements
http://www.nal.usda.gov/fnic/etext/fnic.html - general topics on food and nutrition

Outline of Course: Laboratory

Lab Manual: "Laboratory Manual for General Organic and Biological Chemistry" by H. Lujan-Upton. The lab manual is available when Lab is in session for $20

Attendance will be monitored in lab. You should check with the instructor to see if it is possible to perform an experiment in another lab section during the week that you must miss a regularly scheduled lab.

Week	Experiment
1	**Check In**
2	**Experiment** 1: Measurements, Conversions & Significant Figures
3	**Experiment 2:** Body Mass Index vs. Abdominal Girth/Height & Making Healthy Food Choices
4	**Experiment 3:** Determination Density of a Solid Via Two Methods & Determination of an Unknown Metal's Identity
5	**Experiment 4:** Determination of an Element's Atomic Weight
6	**Experiment 5:** Molecular Models & Covalent Bonds
7	**Experiment 6**: Solubility (Physical Changes) vs. Chemical Reactions & Rates
8	**Experiment 7:** Types of Chemical Reactions
9	**Experiment 8:** Acids, Bases, and Antacids
10	**Experiment 9:** Preparation of Aspirin
11	**Experiment 10:** Reactions of Alcohols, Phenols, Aldehydes and Ketones
12	**Experiment 11:** Chemistry of Carbohydrates
13	**Experiment 12:** Properties of an Enzyme: Wheat Germ Acid Phosphatase
14	**Check-Out**

SAFETY GLASSES MUST BE WORN IN THE LABORATORY AT ALL TIMES

If you have any disabilities or problems with performing in the lab, you should notify the instructor during the first week. All students are required to take the laboratory component.

The experiment assigned for the day should be read before coming to lab and the prelab exercise must be handed in before beginning the lab experiment for the day. The lab report must be handed in for grading upon completing that lab experiment. Attendance will be taken in the laboratory. A lab coat is recommended. Safety glasses or goggles are mandatory and are available in the chemical stockroom, at the bookstore, or may be purchased at your local hardware store.

LONG ISLAND UNIVERSITY – CHEMISTRY DEPARTMENT

SAFETY PRECAUTIONS

Although working with various chemicals can be hazardous, scientists carry out investigations with a minimum of problems by observing a few sensible precautions. A knowledge of the toxicity, reactivity, flammability and other properties of chemical reagents is essential before use, as well as a knowledge of proper laboratory protocol. Precautions needed in handling any specific chemical reagent are detailed in your laboratory instructions. Below are general laboratory safety guidelines. It is imperative that you are familiar with the procedures for each experiment and also read, understand, and practice the following precautions in the laboratory.

1. **Proper attire is required in order to enter the laboratory**. Wearing shorts, skirts, and open toe shoes (i.e.: sandals) are prohibited in the labs.
2. Personal protective equipment (PPE) is of the student's responsibility. This includes safety goggles, gloves, and lab coats. Equipment will be available for purchase in the Campus Bookstore. **Students will not be able to attend lab without proper PPE.**
3. Safety goggles and lab coats **must** be worn at all times in the laboratory whether or not you are carrying out any experiments.
4. **Never** enter the laboratory or attempt to work in the absence of an instructor.
5. If at any time you intend to deviate from the assignment for the day, notify the instructor and obtain permission.

6. Treat all chemicals with maximum care. Assume that all are highly toxic and flammable.
7. Eating, drinking, and smoking in the laboratory is **prohibited**.
8. **Never** sit or lean on the laboratory bench tops.
9. Be careful with open flames. It is recommended for students with long hair to tie up their hair when dealing with open flames.
10. Inform the professor of any chemical spillage immediately, **do not attempt to clean the spill.**
11. Inform the professor of any broken glassware or equipment immediately, **do not attempt to clean the area or repair the equipment yourself.**
12. Be aware of the proper waste disposal protocols and place all waste in the appropriate container
13. Keep the bench-top free of towels (both paper and cloth), bags and books. Only approved apparatus and the laboratory notebook should be routinely on the working surface.
14. **Never** point the open end of any vessel, flask, test tube, vial, separatory funnel *etc*. containing possible reactants toward yourself or any other person.

15. Learn the location and correct use of fire extinguishers, the fire blanket, safety showers, and eyewash fountains in your laboratory.
16. Be prepared for each day's work in the laboratory by having your notebook in shape. The experimental procedure should be well known before coming to lab. Observe all precautions detailed in the laboratory write-up or manual.
17. **Always have the instructor check your setup of apparatus before starting a procedure**.
18. **Do not hesitate to ask for assistance from the professor**.

ANY STUDENT WHO FAILS TO ABIDE BY THESE RULES WILL BE ASKED TO LEAVE THE LABORATORY.

Failure to observe any of the above regulations can result in you being dropped from the course and receive disciplinary actions from the Dean of Students.

Your signature will be required on the first day of lab to attest to the fact that you have read, understood, and intend to abide by these rules.