

LINCOLN UNIVERSITY
DEPARTMENT OF DEPARTMENT OF CHEMISTRY
COURSE SYLLABUS

COURSE TITLE: CHEMISTRY FOR HEALTH SCIENCES II

COURSE NUMBER: CHE 121

PREREQUISITES/CO-REQUISITES: MAT 110 (College Algebra)

COURSE DESCRIPTION (as in the university bulletin): CHEM-121 is an introductory course, which is designed exclusively for Health Sciences (and required) for Pre-Nursing majors. It is a one-semester course that will discuss fundamental principles of General Chemistry basic to the understanding of the health related sciences. Principles of atomic structure, periodicity, chemical bonding, molecular structure, stoichiometry, states of matter, thermodynamics, acids and bases, concentration units, kinetics, equilibria, nuclear chemistry, and electrochemistry will be discussed. Additionally, fundamentals of organic nomenclature and a survey of the physical, chemical and biological properties of the main organic functional groups will be covered. One year of high school chemistry is recommended; high school algebra or concurrent registration in MATH-110 or a higher-level mathematics course is required for CHEM-121. Three hours of lecture and three hours of laboratory per week are required.

REQUIRED TEXT(S)/MATERIALS:

1. General, Organic, and Biological Chemistry: "Structures of Life", Third Edition by Karen C. Timberlake
2. Karen C. Timberlake, Laboratory Manual for General, Organic and Biological Chemistry, First Edition, Prentice Hall, Upper Saddle River, NJ. 2007.

COURSE STUDENT LEARNING OUTCOMES:

As this course progresses and at the conclusion of this course, the student will be able to do the following:

1. Perform calculations involving dimensional analysis, concentration and dilution, and other kinds of measurement, particularly as applied to nursing situations.
2. Describe the shell model of the atom, find the valence electrons of atoms and ions and understand the trends of the periodic table.
3. Name and identify binary compounds (salts, acids and bases) and polyatomic ions.
4. Balance and complete basic chemical reactions involving binary compounds and polyatomic ions.
5. Explain the properties and concepts of pH, acids, bases and buffers and apply these concepts to problems involving systems of the human body.
6. Understand ionic, polar and non-polar covalent bonding.
7. Draw molecular structures, indicating bond and molecular dipoles and use VSEPR theory to predict molecular shapes.
8. Describe intermolecular forces and predict their effects on physical properties of solutions.
9. Understand basic gas laws, especially in regard to the human respiratory system. Understand the relationships between respiration and blood pH.
10. Name and draw the major organic functional groups (alcohols, thiols, aldehydes, ketones, acids and acid derivatives, amines).

PROGRAM STUDENT LEARNING OUTCOMES:

1. The student will be proficient in the five areas of chemistry (analytical, biochemistry, inorganic, organic, physical).
2. The student will be proficient in data collection and analysis.
3. The student will be proficient in reading and interpreting scientific literature.
4. The student will be proficient in scientific writings based on the accepted ACS guidelines.
5. The student will be proficient in giving scientific presentations.
6. The student will have knowledge of common laboratory techniques and the safety practices in the laboratory.

CORE CURRICULUM STUDENT LEARNER OUTCOMES:

1. Listen and effectively communicate ideas through written, spoken and visual means. (communication)
2. Think critically via classifying, analyzing, comparing, contrasting, hypothesizing, synthesizing, extrapolating and evaluating ideas. (Critical thinking)
3. Apply information literacy/research skills to assist their systematic process of critical thought; articulating the problem; gather information from multiple sources and venues; evaluating the accuracy/thoroughness/timeliness of the collected data, and determining when/if the problem has been satisfactorily resolved. (Information Literacy/Research)
4. Apply and evaluate quantitative reasoning through the disciplines of mathematics, computational science, laboratory science, science, selected social sciences and other like-minded approaches that require precision of thought. (Quantification)

DIRECT AND INDIRECT ASSESSMENT MEASURES FOR EACH SLO

1. Laboratory reports measured by rubrics for student's competency in effectively communicating the hypothesis, purpose, methods, results and analysis of an experiment. 75% of students should reach the minimally acceptable score of 75% (C).
2. Essays assessed by rubrics to measure effective communication of biological concepts. 50% of the students should reach the minimally acceptable score of 75% (C).
3. Research papers assessed by rubrics to measure students' ability to use the scientific literature to research a topic and to use that research to write grammatically-correct, coherent and well supportive paper. 75% of students should reach the minimally acceptable score of 75% (C).
4. Pre and post-test questions using select course and program SLO-specific questions to assess learning. 85%-100% of the students should demonstrate learning gains on the post-test and 50% of the students should reach the minimally acceptable score of 75% (C).
5. Select multiple choice questions on hour and final examinations designed to measure specific SLOs. 75% of students should reach the minimally acceptable score of 75% (C).
6. Short answer questions on hour and final examinations designed to measure specific SLOs. 75% of students should reach the minimally acceptable score of 75% (C).
7. Essay questions on hour and final examinations designed to measure specific SLOs. 75% of students should reach the minimally acceptable score of 75% (C).

CALCULATION OF FINAL GRADES:

The final grade shall be the average of grades earned on quizzes, tests, assignments, laboratory reports, mid-term and final examinations. The final examination is comprehensive and includes everything covered during

the semester. The ACS standardized exam will be given and used only for assessment of teaching effectiveness and student achievement.

Course Evaluation

Hour Examinations	40%
Laboratory	20%
Supplemental Activities	
Homework/Quizzes/In-Class Participation	20%
Final Exam	20%
Total	100%

A grades (%)	B grades (%)	C grades (%)	D and F grades (%)
A = 95 – 100	B+ = 87 – 89	C+ = 77 - 79	D+ = 66 - 69
A- = 90 – 94	B = 84 - 86	C = 74 - 76	D = 55 - 65
	B- = 80 - 83	C- = 70 - 73	F = below 55

SCHEDULE OF LEARNING OPPORTUNITIES (ASSIGNMENTS):

DATE	WEEK	TOPIC	CHAPTER	Concept/Activity
Week 1	1-3	Introduction to Organic Chemistry	11	Writing structures and using Molecular Models
TBD	3	Alkenes, Alkynes, and Aromatic Compounds	12	Writing structures and using Molecular Models
TBD	4	Alcohols, Phenols, Thiols, Ethers	13	Characterization of Functional Groups using uV/Vis and IR
TBD	5	Aldehydes, Ketones, and Chiral Molecules	14	Synthesis of Cinnamaldahyde
TBD	6	Carbohydrates	15	
TBD	7	Carboxylic Acids	16	
TBD	8	Lipids	17	Review of research article on importance and function of lipids
TBD	9	Amines and Amides	18	
TBD	10	Amino Acids and Proteins	19	Review of research article on importance and function Protein Structure and Function
TBD	11	Enzymes and Vitamins	20	
TBD	12	Nucleic Acids and Protein Synthesis	21	
	13	Metabolism: Carbohydrates	22	Review of research article on Metabol Diseases
TBD	14	Metabolism and Energy, Lipids and Amino Acids	23/24	
TBD	15	Review		

Attendance and other policies:

Attendance is required and will be taken each class. In accordance with University Policy, (see handout) you will be allowed four unexcused absences. Any student missing four or more classes will automatically fail the course. Students are expected in class on time. Lateness will not be tolerated. Three tardiness' constitute one absence.

Tests missed due to excused absences must be made up within one week. There will be no make-up exam/test for unexcused absences.

Please, switch off your phones before entering the classroom. Receiving and making calls during classes will not be tolerated. It constitutes disruption and distraction to the professor and the students.

Students are required to purchase the prescribed book for this class. It will be practically impossible for any student to attain the expected learner outcomes in this course without owning a book.

Academic integrity

Lincoln University faculty approved a statement on academic integrity in November 1995. (see handout) For acts of academic dishonesty (cheating or plagiarism), there are three possible sanctions; these include a warning, failure for the project (exam or paper), and failure for the course. The written warning becomes part of your academic file in the Registrar's Office and, if there are no subsequent incidents of academic dishonesty, the letter will be removed at the time of graduation. For this course, the first instance of academic dishonesty will result in failure for the project; a second instance will result in failure for the course.

1. **Academic Integrity.** *Students are responsible for proper conduct and integrity in all of their scholastic work. They must follow a professor's instructions when completing tests, homework, and laboratory reports, and must ask for clarification if the instructions are not clear. In general, students should not give or receive aid when taking exams, or exceed the time limitations specified by the professor. In seeking the truth, in learning to think critically, and in preparing for a life of constructive service, honesty is imperative. Honesty in the classroom and in the preparation of papers is therefore expected of all students. Each student has the responsibility to submit work that is uniquely his or her own. All of this work must be done in accordance with established principles of academic integrity.*

Acts of Academic Dishonesty (Cheating)

Specific violations of this responsibility include, but are not limited to, the following:

- ❑ *Copying, offering and/or receiving unauthorized assistance or information in examinations, tests, quizzes; in the writing of reports, assigned papers, or special assignments, as in computer programming; and in the preparation of creative works (i.e. music, studio work, art).*
- ❑ *The fabrication or falsification of data, results, or sources for papers or reports.*
- ❑ *The use of unauthorized materials and/or persons during testing.*
- ❑ *The unauthorized possession of tests or examinations.*
- ❑ *The physical theft, duplication, unauthorized distribution, use or sale of tests, examinations, papers, or computer programs.*
- ❑ *Any action that destroys or alters the work of another student.*

- ❑ *Tampering with grades, grade books or otherwise attempting to alter grades assigned by the instructor.*
- ❑ *The multiple submission of the same paper or report for assignments in more than one course without the prior written permission of each instructor.*

Plagiarism

If a student represents “another person's ideas or scholarship as his/her own,” that student is committing an act of plagiarism. The most common form of plagiarism among college students is the unintentional use of others' published ideas in their own work, and representing these ideas as their own by neglecting to acknowledge the sources of such materials. Students are expected to cite all sources used in the preparation of written work, including examinations. It is each student's responsibility to find out exactly what each of his/her professors expects in terms of acknowledging sources of information on papers, exams, and assignments.

Students with disabilities

Lincoln University approved a statement on the accommodation of students with disabilities. Lincoln University is committed to non-discrimination of students with disabilities and therefore ensures that they have equal access to higher education, programs, activities, and services in order to achieve full participation and integration into the University. In keeping with the philosophies of the mission and vision of the University, the Office of Student Support Services, through the Services for Students with Disabilities (SSD) Program, provides an array of support services and reasonable accommodations for students with special needs and/or disabilities as defined by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. The Services for Students with Disabilities Program seeks to promote awareness and a campus environment in which accommodating students with special needs and/or disabilities is a natural extension of the University's goal.

Students with disabilities must inform the relevant office or contact the course instructor.