Las Positas College
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Course Outline for CHEM 30B

INTRO AND APPLIED CHEMISTRY II

Effective: Spring 2016

I. CATALOG DESCRIPTION:
CHEM 30B — INTRO AND APPLIED CHEMISTRY II — 4.00 units

Continuation of Chemistry 30A with emphasis on organic and biochemical concepts related to human physiological systems.

3.00 Units Lecture 1.00 Units Lab

Prerequisite
CHEM 30A - Intro and Applied Chemistry I
with a minimum grade of C

Grading Methods:
Letter Grade

Discipline:

	MIN
Lecture Hours:	54.00
Lab Hours:	54.00
Total Hours:	108.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. CHEM30A

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Distinguish between properties of organic compounds and inorganic compounds;
B. Describe the physical and chemical properties of hydrocarbons, alcohols, ethers, mercaptans, aldehydes and ketones, carboxylic acids and esters, amines and amides
C. Name organic compounds with IUPAC and/or common or trivial names
D. Describe the structure, properties, and functions of carbohydrates, lipids, amino acids and proteins, and nucleic acids
E. Interpret the reactions involved in the metabolism of carbohydrates, lipids, proteins, and nucleic acids
F. Describe the factors affecting fluids and electrolytes, including pH, in physiological systems
G. Perform laboratory experiments in an efficient, safe, and purposeful manner;
H. Dispose of chemical wastes properly.

V. CONTENT:
A. Safety in the laboratory and proper disposal of waste materials
B. Hydrocarbons
C. Functional groups: structure and reactivity sufficient to interpret reactions in biochemical systems
    1. Alcohols, ethers and mercaptans
    2. Aldehydes and ketones
    3. Carboxylic acids and esters
    4. Amines and amides
D. Carbohydrates
E. Lipids
F. Proteins
G. Nucleic acids
H. Enzymes, vitamins, and hormones
I. Metabolism of carbohydrates, lipids, and proteins
J. Fluids and electrolytes
K. Quantitative and qualitative experiments in the laboratory, including
    1. Synthesis of aspirin
    2. Tests for functional groups
    3. Biochemical experiments

VI. METHODS OF INSTRUCTION:

A. Lecture, informal with student questions encouraged
B. Audio-visual materials which may include any of the following 1. Periodic table 2. Molecular models 3. Ttransparencies 4. PowerPoint presentations 5. Computer simulations
C. Proper chemical hygiene is taught and enforced in all laboratories.
D. Laboratory experimentation, including individual and group work
E. Safety and proper respect for chemicals and scientific apparatus are constantly stressed.
F. Demonstrations of chemical reactions and related phenomena

VII. TYPICAL ASSIGNMENTS:

A. Reading
    1. Read the chapter on aldehydes and ketones.
    2. Be prepared to predict what happens when an aldehyde is treated with an oxidizing agent.
B. Laboratory
    1. Investigate the solubility of amines in acidic, alkaline, and neutral solutions.
    2. Identify the amines present in cold medications by means of thin-layer chromatography.

VIII. EVALUATION:

A. **Methods**

    1. Other:
        a. Homework
        b. Quizzes
        c. Tests (typically one-hour, consisting of a mixture of multiple-choice and short answer questions)
        d. Written lab reports
        e. Final Examination

B. **Frequency**

    1. Homework is typically assigned by the chapter. It may or may not be collected at the discretion of the instructor.
    2. Quizzes may consist of daily one-question tests or may be administered every one to three weeks.
    3. Tests may be given from 1 to 5 times during the term, depending upon the frequency of quizzes.
    4. A minimum of 10 written laboratory reports based on departmentally approved experiments and graded on criteria that may include the following
        a. Completeness of data collected
        b. Quality of data collected
        c. Computational precision and accuracy
        d. Proper use of symbolic notation
        e. Quality of analysis of scientific principles explored
        f. Quality of narrative explanations and reasoning

IX. TYPICAL TEXTS:

1. Stoker, Stephen. *General, Organic and Biological Chemistry.* 7 ed., Cengage Learning, 2016.
2. Timberlake, Karen. *General, Organic, and Biological Chemistry: Structures of Life.* 5 ed., Prentice Hall, 2016.
3. Bettelheim, Frederick, William Brown, Mary Campbell, Shawn Farrell, and Omar Torres. *Introduction to General, Organic, and Biochemistry*. 11 ed., Cengage Learning, 2016.
4. Adams, Jim. Molecules to Metabolism. Las Positas College , 2015.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Safety goggles approved for Chemistry laboratory
B. Scientific calculator