CHE 105L-02
LAB SYLLABUS

Discovering Chemistry with Lab **Fall 2008**

Section 02 Wed. 1:00 p.m. – 2:50 p.m. SC 462
Reasoning through the Discovery Process: A Study of Chemistry and Chemical Energy

Instructor: Julia Y. Bedell
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Office Hours: Tuesday 1:30PM-2:30PM
Wednesday 9:00AM-9:50AM
Other hours by appointment.

PREREQ: None

CO REQ: CHE 105-01, 02 Lectures (G. Fields)

PURPOSE: This course stresses discovery-based learning in a laboratory environment and will complement and enhance the lecture content presented in CHE 105. The lab offers an opportunity for students to develop reasoning and analytical skills that are essential for pre-service teachers (elementary and middle school education majors).

REQUIRED TEXT AND MATERIALS:

1. CHE 105 NKU Laboratory Manual (Discovering Chemistry with Lab : CHE 105 LaboratoryManual; Vinay Kumar and Julia Y. Bedell; 2008 edition.

2. Safety glasses and sponge

MAJOR LEARNING OBJECTIVES:

1. Make mass and volume measurements; record, and use this data to determine density of water.
2. Plot mass volume data manually to determine density of a US penny and identify the metal it is made of.
3. Write a student-designed protocol and carry out separation of a mixture consisting of salt, sand, iron filings, and Styrofoam pellets.
4. Know how to write a formal lab report for 'Separation of a Mixture' experiment.
5. Build a Conductivity Detector and use it to classify acids, bases, and salts and several household materials as strong, weak or non- electrolytes.
6. Use a Lab Pro and a computer-interfaced temperature sensor to collect, display, plot, and analyze data accompanying physical changes and chemical reactions.
7. Study four properties (conductivity, solubility, combustibility and melting point) of known inorganic and organic compounds, and use the observations to identify an unknown compound.
8. Use a Lab Pro and a computer-interfaced temperature sensor, and a calorimeter to determine the heat content of peanut, cashew, marshmallow, and popcorn.
9. Carry out microscale determination and calculate the amount of vitamin C (ascorbic acid) in vitamin C tablet, orange juice and orange drink.
10. Use various methods, including use of a computer-interfaced pH sensor, to determine the pH of common lab reagents and household materials.
11. Synthesize two esters (methyl salicylate and isobutyl acetate) and four polymers (nylon, silly putty, slime, and polystyrene).

12. Carry out computer simulation of several acid-base titrations, study the corresponding titration curves, and compare various indicators.
13. Use the guided-inquiry approach to identify six common plastics based on the data/observations of their properties.
14. Be able to carry out basic laboratory experiments in a safe and effective manner.

COURSE REQUIREMENTS (Lab):

1. **Attendance is mandatory for every laboratory session**. Missed labs will be assigned a grade of zero unless arrangements are made with the instructor. Students must provide legitimate proof to be excused from a lab.

2. Wearing of safety glasses, compliance with safety procedures (including proper waste disposal), and upkeep of the lab area comprise part of the student's participation grade. Instructor-initiated withdrawal of a student will occur if a student's conduct in the lab is judged to be unsafe or disruptive.

3. Prior to each experiment, there will be a pre-lab quiz. This quiz will be based on the introductory material, the objective, assigned readings, selected portions of the experimental procedure, and safety rules. **There will be no make-up quiz and a grade of zero will be assigned for a missed quiz.**

4. Formal lab reports will be required for some of the experiments. These experiments will be identified during the semester.

5. Lab reports (including data sheet, discussion questions, and graphs) must be turned in at the beginning of the following lab. A 10% deduction will be imposed for lateness per week. Lab reports more than two weeks late will be assigned a grade of 45 out of 75 (for most of the experiments) or 60 out of 100 (for experiments with formal lab reports). If the experiment is completed but the lab report is never submitted, a grade of 30 out of 75 or 40 out of 100 will be assigned.

6. All written work must be legible and grammatically correct. Use only loose-leaf papers that are <u>stapled together</u>. The organization and presentation of the reports will be graded. All written work must be completed <u>independently</u> to receive credit.

7. <u>Email:</u> All students are required to access the NKU email on a regular basis. Anytime you communicate with me via email please observe the following protocol.
   - In the Subject heading of your email identify your class (**CHE 105 Lab**) before you start on your message. I do not open e-mail messages without proper subject headings.
   - You should present your email similar to a letter or memo.
   - My reply to your e-mail is **your confirmation** that I received the message.

8. Student access to Blackboard is required. Students are responsible for any information and updates posted on Blackboard.

GRADING:

Pre-lab Quizzes	5%
Laboratory participation, results and reports	60%
(Lab report = 75 points, Final Lab report = 100 points)	
Tests and Lab Practicals	35%

LAB SCHEDULE: Please see page 4.

ADDITIONAL INFORMATION

Policies of the Department of Chemistry at Northern Kentucky University

- All items on syllabi are subject to change by the instructor.
- The work you will do in any course is subject to the Student Honor Code. The Honor Code is a commitment to the highest degree of ethical integrity in academic conduct, a commitment that, individually and collectively, the students of Northern Kentucky University will not lie, cheat, or plagiarize to gain an academic advantage over fellow students or avoid academic requirements.
- Cheating will not be tolerated. In accordance with the Code of Student Rights and Responsibilities, faculty members have the right to determine actions to be taken when a student is caught cheating. In this class, students caught cheating or plagiarizing for the first time will receive a grade of zero for that test or assignment. Students caught cheating or plagiarizing a second time will receive an F for the course and will be reported to the Dean of Students.
- Cell phones and pagers can only be used for emergency purposes.
- Students are responsible for reading and understanding all items on this syllabus. Any items not understood must be brought to the attention of the instructor within the first two weeks of class.
- "Students with disabilities who require accommodations (academic adjustments, auxiliary aids or services) for this course must register with the Office of Disability Services; University Center Suite 320; (859) 572-6373. Verification of your disability is required in the disability services office for you to receive reasonable academic accommodations. For more information visit website at www.nku.edu/~disability."
- Students not present for the first meeting of a chemistry laboratory in which they have enrolled may be dropped from the class immediately, unless they have notified the instructor of the chemistry department at 572-5409 of their expected absence. If the lab from which they are withdrawn is a co-requisite for a lecture course, the student will be withdrawn from that lecture also.
- If you withdraw from the lecture course, you MUST also withdraw from the lab course.
- Faculty members reserve the right to dismiss or to have removed a disruptive student from their classrooms.

CHE 105L
Fall 2008 Lab Schedule

Week No	Dates	Lab (Wed)
1	Aug. 27	Introduction, Check in, and Lab Safety video

2	Sept. 3	Exp 1 Measurements
3	Sept. 10	Exp 2 Separation of a Mixture
4	Sept. 17	Exp 4 Conductivity Detector
5	Sept. 24	Exp 5 Properties of Matter
6	Oct. 1	Exp 13 Energy of Physical Processes (Lab Pro/Calculator)
7	Oct. 8	Exp 6 Chem Reaction & Energy (Computer Interface experiment)
8	Oct. 15	Lab Test 1 and Lab Practical (TBA)
9	Oct. 22	Exp 7 Energy Content of Foods (Computer Interface Exp.)
10	Oct. 29	Exp 8 Vitamin C Analysis
11	Nov. 5	Exp 9 Acids & Bases (CBL experiment)
12	Nov. 12	Exp 10 Acid-base titration (Computer simulation Exp.)
13	Nov. 19	Exp 11 Synthesis of Esters & Polymers
14	Nov. 26	Thanksgiving No Lab
15	Dec. 3	Exp 12 Identification of Plastics
16	Dec. 10	Lab Test #2 and LabPractical (TBA)

IMPORTANT UNIVERSITY DATES:

September 15 (Mon.) Last day to drop a course without a grade
November 3 (Mon.) Last day to drop a course with a grade of "W"