

**CHE 105L-001  
LAB SYLLABUS**

**Discovering Chemistry with Lab**

**Spring 2009**

**Section 001 Wed. 11:00 a.m. – 12:50 p.m. SC 462**

Reasoning through the Discovery Process: A Study of Chemistry and Chemical Energy

Instructor: Gwen Fields  
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Office Hours: M, F 11-12:30

**PREREQ:** None

**CO REQ:** CHE 105-01, 02 (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; Spring 2009 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. If you miss lab you must contact me by phone or e-mail by 2p.m. the day of the missed lab. You must leave a phone number so that I may call you back. If you don't hear back from me by 2:15 assume that I did not receive your communication and try again. Students must provide legitimate proof to be excused from a lab. No more than 2 make-up labs will be granted per student.
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.
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. If you are more than 5 minutes late for lab you may not take the 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 day. Lab reports more than two weeks late will not be accepted.

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 stapled together prior to lab. The organization and presentation of the reports will be graded. All written work must be done independently to receive credit.
7. Email: 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 105L-001**) before you start on your message. I do not open e-mail messages without proper subject headings.
  - If the e-mail is in regards to a missed lab you must include a phone number where I can reach you.
  - 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%
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](http://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**  
Spring 2009 Lab Schedule

<b>Week No</b>	<b>Dates</b>	<b>Lab (Wed)</b>
1	Jan. 14	Introduction, Check in, and Lab Safety
2	Jan. 21	Exp 1 Measurements
3	Jan. 28	Exp 2 Separation of a Mixture
4	Feb. 4	Exp 4 Conductivity Detector
5	Feb. 11	Exp 5 Properties of Matter
6	Feb. 18	Exp 13 Energy of Physical Processes (Lab Quest)
7	Feb. 25	Exp 6 Chemical Reaction & Energy (LabQuest)
8	Mar. 4	Lab Test 1 & Lab Practical (TBA)
9	Mar. 11	<b>Spring break</b>
10	Mar. 18	Exp 7 Energy Content of Foods (LabQuest)
11	Mar. 25	Exp 8 Vitamin C Analysis
12	April 1	Exp 9 Acids & Bases (LabQuest)
13	April 8	Exp 10 Acid-base titrations, Indicators, & pH (Computer simulation Exp.)
14	April 15	Exp 11 Synthesis of Esters & Polymers
15	April 22	Exp 12 Identification of Plastics
16	April 29	Lab Test #2, Lab Practical (TBA)

**IMPORTANT UNIVERSITY DATES:**

March 30            Last day to drop a course with a grade of "W"  
 March 9-14        No classes (Spring break)