

**CHE 105-001,002  
COURSE SYLLABUS**

**Discovering Chemistry with Lab**  
**MWF 10.00-10.50a SC 308**

**Spring 2008**

**Instructor: Vinay Kumar**  
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Office Hours: MWF 9:00 - 9:50a  
T 10:00-noon  
Other hours by appointment.

**PRE-REQUISITE:** None

**COREQUISITE:** CHE 105L

**All items on this syllabus are subject to change by the instructor.**

**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.**

**REQUIRED COURSE MATERIALS:**

1. *World of Chemistry* textbook (Second Edition), M. D. Joesten and J. L. Wood, Thomson Custom Solutions, Mason, Ohio. (2006).
2. General Chemistry Interactive CD-ROM version 3.0, Thomson, Brooks/Cole
3. *Discovering Chemistry with Lab: Lab Manual*; Kumar & Bedell; Spring 2008 edition.

**Optional Resource:** Study Guide for the textbook. You may purchase your own study guide or use the copy that has been placed on reserve in the Steely Library.

**COURSE Web page:** This syllabus and other pertinent information about the course, including the assignments, are available on the CHE 105 web page on the internet; <http://www.nku.edu/~chemistry/che105>

**PURPOSE:**

This chemistry course integrates content presentation with laboratory experience and small group learning activities. Through these three components the students will have the opportunity to acquire the knowledge, experience the process of applying the knowledge, and construct a better understanding of chemistry and chemical issues. In so doing, this course will address both the content and the process of learning chemistry.

This course was funded by a matching grant from DOE/KyEPSCoR and models teaching strategies recommended in the science education reform literature (including the KERA philosophy) in the teaching of chemistry to elementary and middle school education majors. A better understanding and appreciation of chemistry and the

related issues by the pre-service teachers should impact positively toward the teaching of science in their future classrooms. Many basic chemical principles and applications will be presented using the multimedia approach. Videodiscs, CD-ROM, Internet, and HyperStudio stacks will be used to illustrate chemical concepts that are hard to present in the traditional lecture format.

### **DEPARTMENT OF CHEMISTRY STUDENT LEARNING OBJECTIVES:**

1. Explain the major concepts and experimental findings in the chemical sciences.
2. Demonstrate the ability to carry out experimental protocols using modern instrumentation and methods.
3. Utilize critical thinking skills to apply concept knowledge and adapt experimental techniques to: a) form and test hypotheses and b) solve scientific problems
4. Compile, critically evaluate, and interpret scientific information and data.
5. Effectively communicate scientific information through written and oral means.
6. Apply effective group strategies to solve scientific problems.
7. Evaluate the relationships between chemistry and mathematics, physics, biology, and other disciplines and between chemistry and society.
8. Apply computer technology and other technologies in the comprehension, interpretation, and presentation of the chemical sciences.

### **OVERALL COURSE OBJECTIVES :**

The main objectives of the course are listed below. For a more detailed list of chapter-wide objectives the student should refer to the Study Guide for the textbook.

1. To promote science literacy in chemistry and to relate this science content to real-life issues.
2. To incorporate student-centered learning by letting students do group projects/assignments. The instructor's role is reduced to that of a monitor or a facilitator.
3. To provide hands-on chemistry experiments that include guided-inquiry and discovery approaches.
4. To help students develop reasoning strategies by performing discovery/small group lab activities, and engaging in post-lab discussions.
5. To effectively model the use of educational technology in the classroom and in the laboratory. Computer-based experiments are carried out in the lab and the multimedia approach is integrated in the classroom by using computers, videodiscs, CD-ROM and other electronic media.

## LECTURE COURSE REQUIREMENTS:

1. **Attendance:** The attendance will be taken during each lecture period. A student missing a class is responsible for all the information and assignments presented in class, including any announcements.
2. **Assignments :** You will be given assignments based on handouts, the internet and CD-ROM. **These will be collected and will not be accepted after the due date.** The assignments and their due dates will be posted on the CHE 105 Web page.
3. **Homework:** Homework based on readings, and questions and problems at the end of each chapter in the text book or the CD-ROM will be assigned (**see attached CHE 105 content document**). Homework will not be collected or graded.
4. **Group Project:** Students in groups of 3-4 will select, research, and write a paper on a topic relating to Energy Resources. The 8-page paper will include information on the following areas: i) the history and development of the energy resource, ii) how is the particular form of energy produced and distributed, iii) applications and uses of the energy, and iv) the advantages and disadvantages of energy resource. More details about this project will be provided later in a handout.
5. **Tests:** There will be three one-hour tests and a comprehensive final exam.

<b>Test Dates:</b>	Test #1	Mon	Feb 11*
	Test #2	Wed	Mar 19*
	Test #3	Fri	Apr 18*
	Final Exam	Wed	May 7 (10:10-12:10pm)

\*Test dates will be confirmed a week before the actual date.

## TEST MAKE-UP POLICY:

Soon after missing a test the student must contact the instructor as soon as possible and make an appointment to discuss the situation in person, preferably, in my office (SC 446). As a general rule, there will be no make-up tests. However, in the case of emergencies and unavoidable situations, at the discretion of the instructor, either a make-up test will be considered or in lieu of test, the final exam grade may count an additional 10%. This policy will be applicable for only one missed test.

6. **Post-lab discussions :** Every Friday during the lecture class the instructor will allow time for any post-lab discussions relating to the lab experiment for that week.

**LECTURE COURSE SCHEDULE:** is posted on the course web page. Please make a hard copy of this document for keeping in your folder.

**LECTURE COURSE TOPICS:** The following chapters will be covered in the order shown below. Sections to be covered will be confirmed in the class and posted on the course web page under CHE 105 CONTENT. Please make a hard copy of this document for keeping in your folder.

<u>Chapter No.</u>	<u>Title</u>
1	Living in a World of Chemistry (sec. 1.1 thru 1.4)
2	Chemical View of Matter
3	Atoms (sec. 3.1 thru 3.5; last page 74)
4	The Periodic Table (sec. 4.1-4.5; last page 103)
6	Chemical Bonds (sec. 6.1-6.3, 6.7, and 6.8)
8	Chemical Reactivity
7	States of Matter and Solutions
10	Oxidation and Reduction
9	Acids and Bases
12	Energy and Hydrocarbons
14	Polymers
13	Alternate Energy Resources

**GRADE (will be based as follows):**

3 Tests	30% (10% each test)
Assignments	10%
Group Project	10%
Final Exam	15%
Final Lab Grade	35%

**Mid-term grades** will be issued to students who have successfully completed fewer than 30 semester hours. Students will be able to access mid-term grades through Norse Express. The deadline for faculty for posting the mid-term grades is March 12.

**Note for Students with disability:** “*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).*”

**HONOR CODE**

As in all other chemistry courses the NKU Honor Code will be enforced in this class. For more information on the Honor Code, please visit the Dean of Students website: <http://www.nku.edu/~deanstudents/HonorCode.htm>

**IMPORTANT UNIVERSITY DATES:**

March 31	Last day to drop a course with a grade of "w"
March 10-15	Spring Break