



## **RADIOCHEMISTRY – CHE 520**

9:30-10:45 AM, Tuesdays and Thursdays, CP-345

Spring 2005  
Department of Chemistry  
University of Kentucky

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Office Hours: T, R 11-12 or by appt.

### **Course Description**

Applications of radionuclides in chemistry are discussed with emphasis on the principles of radioactive decay, interactions of radiation with matter, isotopic tracers, nuclear methods of analysis, hot atom chemistry, nuclear dating methods, and nucleosynthesis of the elements.

### **Prerequisites**

Two semesters of college general chemistry are required. Courses in analytical chemistry and introductory calculus are recommended.

### **Lecture Outline**

Reading assignments generally follow the order of the chapters in the text. Each chapter should be read **prior to** the first lecture on that topic.

### **Attendance**

Lecture attendance is not required; however, because the examinations are based heavily on the lecture presentations, experience has shown that **regular attendance is very important**.

### **Recommended Text**

W. D. Ehmann and D. E. Vance, *Radiochemistry and Nuclear Methods of Analysis*, John Wiley and Sons, New York, 1991 (available in paperback, ISBN 0-471-30628-2).

## Reference Materials

Additional materials are on reserve in the Chemistry-Physics Library, including:

*Nuclear and Radiochemistry*, Friedlander *et al.*, 1981

*Radiochemistry and Nuclear Chemistry*, Choppin, Liljenzin, and Rydberg, 3<sup>rd</sup> Ed., 2002

*Radiation Detection and Measurement*, Knoll, 3<sup>rd</sup> Ed., 2000 (instrumentation)

An on-line version of the *Chart of the Nuclides* is available at <http://atom.kaeri.re.kr/>.

## Problems Sets and Outside Assignments

Homework problem sets will be assigned, collected, and graded. Late homework will not be accepted. A few special topical lectures/seminars presented outside the scheduled class hour may be recommended to students and compensating class time will be released. If schedule conflicts prevent you from attending these lectures or seminars, an alternate assignment will be provided.

## Cheating and Plagiarism

According to University Senate Rules, the minimum penalty for either of these offenses is an "E" in the course!

## Grading Basis

Examinations (2/10/05, 3/24/05, and 4/21/05)	60 %
Two-hour comprehensive final exam (8:00 AM, 5/5/05)	30 %
Problem sets/other assignments	<u>10 %</u>
	100 %

Grades will be based on the standard University scale: A = 90–100, B = 80–89, C = 70–79, D = 60–69, E = below 60 for undergraduates and below 70 for graduate students. (The D grade is for undergraduate students only.)

Since the expectations for graduate students are different from those for undergraduate students, additional problems will be required for graduate students and will be a component of the 10% ascribed to problem sets/other assignments.

Formal written excuses consistent with University regulations will be required for each exam absence before a makeup exam can be scheduled. Makeup exams will be given only at one time, after the third exam. Notice of intended absence due to a religious holiday must be presented, in writing, before 2/2/05.