

Prof. Romualdo de Souza
Office C230
Tel.: 855-3767
E-mail: rdesouza@indiana.edu

Associate Instructor: Mr. Blake Wiggins brywiggi@indiana.edu

Lecture (**attendance required**): TR 1:00 – 2:15 pm in C001

Discussion section: (**attendance required**)

Section 8667 5:45 pm – 6:35 pm Tues. BH 231

Section 8668 5:45 pm – 6:35 pm Thurs. BH 231

- Textbook :
- 1) Nuclear and Radiochemistry, (**OPTIONAL**)
Friedlander, Kennedy, Miller, and Macias (FKMM)
(on reserve in chemistry library)
 - 2) FREE e-textbook being developed by V.E. Viola and R.T. deSouza

Supplementary material : LECTURE NOTES (on course Website)

Answers to problem sets (on course Website)

Radiochemistry and Nuclear Methods of Analysis

By Ehmann and Vance, (EV) on reserve in chemistry library

Nuclei and Particles by Emilio Segre (ES, more advanced)

Website: <http://courses.chem.indiana.edu/c460/>

Office Hours (RdS) : Tuesdays 3 pm – 4 pm
Wed. 10:30 am – noon
Or by appointment

Office Hours (AI) : in C046
Monday 3:30 pm – 5:00 pm (Blake)
Or by appointment

Grading : Grades will be determined based on a point system

Unannounced in-discussion quizzes (6-7)	60 points (lowest score dropped)
Homework problem sets (~ weekly)	240 points
In-term Exam #1	150 points
In-term Exam #2	150 points
Final exam (cumulative)	250 points
Participation in Discuss. Sect./class	50 points

The in-term exams will be held during the evenings at the end of September/early October and mid-November. The exact time of the exams will be discussed in class. **The final exam is Wed., Dec. 14th from 5:00 PM – 7:00 PM.** No excuses for missing either the in-term or final exams will be tolerated. Contact Prof. de Souza well in advance if an **academic conflict** exists.

PATH TO SUCCESS IN C460

- Read associated material
- Attend all lectures, take notes; ask questions; answers questions; BE ENGAGED
- Work hard to make sure you understand how to successfully complete homework/CALM and practice exams.
- **MAKE USE OF OFFICE HRS !!!**
- Make sure you understand what you did wrong on quizzes and exams

Planned Schedule of Lectures

Lecture	Topic	Material to read
8/23	Radioactivity and the nature of atoms	Ch. 1 (FKMM)
8/25	Rutherford scattering, Nuclear binding and energetics	Ch. 2 (FKMM)
8/30	Nuclear Decay modes, Nuclear Sizes, shapes, and the Liquid drop model	Ch. 2 (EV); Ch. 3 (FKMM)
9/1	Beta stability and the LD Mass Formula	Ch. 14.3 (EV); Ch. 4 (ES); Ch. 15 (FKMM)
9/6	Accelerators	Ch. 6 (FKMM); Ch. 2 (ES)
9/8	Interaction of Radiation with matter	Ch. 7 (FKMM); Ch. 3 (ES)
9/13	Interaction of Radiation with matter (cont'd)	
9/15	Detectors	Ch. 9 (FKMM)
9/20	Forces, Potentials, and the Shell Model	Ch. 9 (FKMM)
9/22	Parity and the Shell Model	Ch. 8 (FKMM)
9/27	Nuclear Potentials and Radioactive Decay (alpha)	Ch. 8 (FKMM)
9/29	Radioactive Decay (beta)	Ch. 8 (FKMM)
10/4	Radioactive Decay modes : Gamma, Fission, Cluster, Delayed n/p, Double Beta decay	
10/6	Radioactive Decay Kinetics	Ch. 3 (FKMM)
10/11	Nuclear Decay kinetics : Transient and Secular Equilibrium	NOTES
10/13	Nuclear Decay kinetics	NOTES
10/18	Nuclear reactions I	NOTES
10/20	Nuclear Reactions II	NOTES
10/25	Nuclear Reactions III	NOTES
10/27	Origin of the elements	NOTES
11/1	Origin of the elements	NOTES
11/3	Biological effects of radiation	NOTES
11/8	Biological effects of radiation	NOTES
11/10	Nuclear Power	NOTES
11/15	Nuclear Power	NOTES
11/17	Nuclear Power	
11/22	THANKSGIVING RECESS	
11/24	THANKSGIVING RECESS	
11/29	Geo and cosmochronology	
12/1	Geo and cosmochronology	NOTES
12/6	Homeland security	NOTES
12/8	Homeland security	NOTES
	FINAL EXAM Dec. 14 th 5:00 PM – 7:00 PM	