CHEM498B. DESCRIPTIVE CHEMISTRY OF THE ELEMENTS

SPRING SEMESTER 2010

Time and Place: Tuesday, Thursday: 12:30-1:45 pm, Room 1228

Instructor: Andrei N. Vedernikov e-mail: avederni@umd.edu

Office: Chemistry 2353 (wing #3) phone: 5-2784

Office hours: Monday, Thursday 2:00-3:00pm or by appointment: call, e-mail or stop by my office

The office is in the room 2353 in the 3rd (new) wing of the Chemistry Building. To get to this area you need to take the new (larger out of two) elevator on the 1st floor at the intersection of the 2nd and 3rd wings.

Required text: N.N. Greenwood, A. Earnshow "Chemistry of the Elements", 2nd Edition, reprinted with corrections, 1998 (and later). ISBN: 978-0-7506-3365-9

Recommended text: D.M.P. Mingoes "Essential Trends in Inorganic Chemistry", 1998. ISBN: 0-19-850108-0

Lecture notes, problem sets, this syllabus and other course-related documents can be found at

http://www2.chem.umd.edu/groups/vedernikov/VGroup_Teaching-10-498.htm

Problem sets will be distributed in class every second Thursday. Solutions are due by the next Thursday lecture. All pdf files with problem sets can be found at the course web-site listed above.

Grading scheme:

Midterm exams (2)	100 points each	200
Final exam	200 points	200
Problem Sets (6)	20 points each, five best scores counted	100
	TOTAL	**500 pts**

Grades: **A**, 425-500 points (≥ 85%); **B**, 375-424 points (≥ 75%); **C**, 325-374 points (≥ 65%); **D**, 275-324 points (≥ 550%); **F**, < 275 points.

Course Objectives
The modern technological society utilizes virtually all the known stable chemical elements and many of the radioactive isotopes as well. At the same time, undergraduate students are typically taught chemistry of carbon only (organic chemistry) and have virtually no knowledge of chemistry of other elements. In the course "Descriptive Chemistry of the Elements" you come to know some fundamental properties of the elements and their compounds. Such knowledge is invaluable for their careers not only in "pure and applied chemistry" but also in pharmacy, geology, environmental science and so on. This course is based on many facts including the most recent reports from research labs that constantly appear in the top chemistry journals and constantly change our understanding of what is possible and what is not possible in chemistry.
Though the facts are important, not a mere memorization of facts but the linking of facts where possible to underlying principles and live demonstrations of the points of the rapid growth of Chemistry constitutes the backbone of this course.

Expectations:
The students are expected i) to attend *all* lectures and read text(s) well in advance before a topic is covered in the class so that the level of discussion and understanding of the course material during lectures will be enhanced, ii) to understand the background theory presented in lectures and in class reading, iii) to work independently and responsibly on problems distributed.

Academic Integrity
The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. As a student you are responsible for upholding these standards for this course. For more information on the Code of Academic Integrity or the Student Honor Council, please visit: http://www.studenthonorcouncil.umd.edu/whatis.html.

Make-Up Exams
Only **university-excused absences** are allowed. Proper documentation is expected. Your instructor must be contacted within 24 hours of the missed exam.

On-line Course Evaluation
This spring we continue the online campus-wide online course evaluation system, CourseEvalUM. Your participation in the evaluation of courses through CourseEvalUM is a **responsibility** you hold as a student member of our academic community. Your feedback is confidential and important to the improvement of teaching and learning at the University. CourseEvalUM will be open for you to complete your evaluations for Spring 2010 courses between April 27 and May 12.
Please go directly to the website (www.courseevalum.umd.edu) to complete your evaluations starting April 27.

Tentative lecture and midterm exam schedule
Numbers in parentheses below indicate the Chapters for your reading in the required text.

Week	Date/Lecture	Topic
1		
Tu	Jan 26 /1	**Introduction.** Course description. Origin of the Elements. Atomic weights (**1**)
Th	Jan 28 /2	Chemical periodicity (**2**)
2		
Tu	Feb 2 /3	Hydrogen. Hydrides. Hydrogen bonding (**3**)
Th	Jan 4 /4	Group 1 metals (**4**) *Home work 1 (Ch. **1-4**)*
3		
Tu	Feb 9 /5	Group 2 metals (**5**)
Th	Feb 11 /6	Boron (**6**) *Home work 1 due*
4		
Tu	Feb 16 /7	Group 13 metals (**7**)
Th	Feb 18 /8	Carbon (**8**) *Home work 2 (Ch. **5-8**)*
5		
Tu	Feb 23 /9	Silicon (**9**)
Th	Feb 25 /10	Germanium, tin and lead (**10**) *Home work 2 due*
6		
Tu	Mar 2 /11	Nitrogen (**11**)
Th	Mar 4	**Midterm exam 1** (*Lectures 1-10*; *Chapters* **1-10**) *Home work 3(Ch. **9-11**)*
7		
Tu	Mar 9 /12	Phosphorus (**12**)
Th	Mar 11 /13	Arsenic, antimony and bismuth (**13**). *Home work 3 due*
8		
Tu	Mar 16	
Th	Mar 18	**Spring Break**
9		
Tu	Mar 23 /14	Oxygen (**14**)
Th	Mar 25 /15	Sulfur (**15**) *Home work 4 (Ch. **12-15**)*
10		
Tu	Mar 30 /16	Selenium, tellurium amd polonium (**16**)
Th	Apr 1 /17	The Halogens (**17**). *Home work 4 due*
11		
Tu	Apr 6 /18	The noble gases (**18**)
Th	Apr 8 /19	Coordination compounds (**19**). Group 3 metals (**20**). *Home work 5 (Ch. **16-20**)*
12		
Tu	Apr 13 /20	Group 4 and 5 metals (**21-22**)
Th	Apr 15 /21	Group 6 and 7 metals (**23-24**). *Home work 5 due*
13		
Tu	Apr 20 /22	Group 8 metals (**25**)
Th	Apr 22	**Midterm exam 2** (*Lectures 11-21; Chapters* **11-24**)
14		
Tu	Apr 27 /23	Group 9 metals (**26**)
Th	Apr 29 /24	Group 10 metals (**27**) *Home work 6 (Ch. **21-27**)*
15		
Tu	May 4 /25	Group 11 and 12 metals (**28, 29**)
Th	May 6 /26	Lanthanides (**30**) *Home work 6 due*
16		
Tu	May 11 /27	Actinides and transactinides (**31**)
17		
Tu	May. 18	**Final exam**, 1:30-3:30 pm / all covered