

**CHEM 411: Advanced Instrumental Methods**  
**Fall 2009, New Mexico Institute of Mining and Technology**

Date and time: Tuesdays and Thursdays, 11:00 am - 12:15 am  
Location: Jones Annex 104  
Textbook: *Principles of Instrumental Analysis* (6<sup>th</sup> edition), by Skoog, Holler, and Nieman,  
Published by Brooks/Cole (Thomson Learning), 2007, ISBN-10: 0-495-01201-7

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Office hours: Tuesday, 2:00-5:00 pm (or by appointment)

**Grading:**

Three exams, 15% each of final grade  
Final exam, 20% of final grade  
Project & presentation, 15% of final grade  
Homework, 20% of final grade

**Homework:** Homework will be assigned on Tuesday of the week and will be due the next Tuesday. Show all your work, partial credit will be given. No credit for answers only.

**Homework lateness policy:** Late homework will lose 20% credit per day, up to 3 days. No homework will be accepted after 3 days (i.e. 12:15 pm Friday). Late homework can be 1) handed to me, 2) put in my mailbox in the chemistry office, 3) slipped under my office door.

**Attendance and participation:** All students are expected to attend every class and to read the appropriate book chapters beforehand. If attendance or participation becomes a problem, pop quizzes will be given.

**Plagiarism:** I understand that students will work together on problem sets. However, blatant “copying” will *at least* result in failure of the course. More severe penalties may apply.

**Illness:** Students who miss classes, homework deadlines, and exams due to serious illness or family emergency must make every effort to contact the instructor *prior* to the absence. A serious illness is defined as something requiring a visit to a doctor. Proof of the emergency will be required before a “make-up” or deadline extension will be allowed.

**Online resources:** A webpage for the course will be updated from time to time. Information posted there may include updates to the syllabus, homework solutions, and grade distributions. Students are responsible for checking the webpage periodically.

**E-mail:** Simple questions about the material or homework can be answered by e-mail. In the case of more complicated questions, I will probably meet you during office hours.

**Chem 411 Lecture Schedule (subject to change)**

Lecture	Date	Topic(s)	Book Chapter(s)	Homework
1	8/25	Introduction	1-4	
2	8/27	Introduction	1-4	
3	9/1	Signals and noise	5	1-7,9; 2-16; 4 -8,10
4	9/3	Signals and noise; Intro to spectrometry	5, 6	
5	9/8	Intro to spectrometry; Optical components	6, 7	4 -11,12; 6-6,8,9
6	9/10	Optical components	7	
7	9/15	Optical components; Intro to atomic spectrometry	7,8	7-12,13,17; 8-8,9
8	9/17	Atomic absorbance	9	
9	9/22	Atomic absorbance; Atomic emission	9, 10	8-10; 9-20,22; 10-4,8
10	9/24	Atomic mass spectrometry	11	
	9/29	No class		
		Atomic mass spectrometry, Molecular Mass Spectrometry		
11	10/1	Atomic x-ray spectrometry; Atomic Spectrometry	11, 20	11-3,8; 20-6,7,11
12	10/6	Comparison	9-12	
	10/8	<i>Exam #1, lectures 1-12</i>		
13	10/13	UV-Vis molecular fluorescence spectrometry	13, 14	13-5,9,17; 14-2,9
14	10/15	UV-Vis molecular absorbance spectrometry	13, 14	
15	10/20	UV-Vis molecular absorbance spectrometry	15	14-20,21; 15-4,7,8
16	10/22	UV-Vis molecular fluorescence spectrometry	15	
17	10/27	Infrared and Raman Spectrometry	16-18	16-1,4,7,10; 17-8;
18	10/29	Infrared and Raman Spectrometry	16-18	
19	11/3	Intro to electroanalytical chemistry	22	18-2,5; 22-6,9,10
20	11/5	Potentiometry and Coulometry	23, 24	
21	11/10	Potentiometry and Coulometry	23, 24	22-13;23-16,18; 24-7
22	11/12	Voltammety	25	
	11/17	<i>Exam #2, lectures 13-25</i>		
23	11/19	Intro to separations	26	
24	11/24	Gas Chromatography	27	
	11/26	Thanksgiving - no class		
25	12/1	High-performance liquid chromatography	28	
26	12/3	Capillary Electrophoresis	30	
	12/8	<i>Exam #3, lectures 26-30</i>		
	12/10	Review		
		Final Exam - day and time TBA		