CHEM 531: Inorganic Chemistry Laboratory (Section 001) – 1 credit hour
Spring 2019

Meeting Times:

Pre-lab Lecture: W 12:30-1:20, Sims 113C
Laboratory: R 2:00-4:50, Sims 310

Instructors:

Dr. Robin Lammi
Office: Sims 313A
Phone: 323-4946
E-mail: lammir@winthrop.edu

Dr. Jay Hanna
Office: Sims 313B
Phone: 323-4933
E-mail: hannaj@winthrop.edu

Office Hours:
Dr. Lammi: M 1:30-3:00; W 9:00-10:30; and any time you care to stop by. Appointments are also welcome.
Dr. Hanna: M 1:30-3:30; you are also welcome to stop by anytime or make an appointment.

Required Course Materials:

Textbook: *Synthesis and Technique in Inorganic Chemistry,* 3rd ed., Girolami et al.
Lab Notebook: Any permanently bound notebook (**no** spirals) with consecutively numbered pages
Safety Eyewear: Splash goggles (preferred) or safety glasses
Calculator: Any scientific or graphing calculator

Course Goals:

Synthesis and characterization of inorganic compounds, including main-group, transition-metal and organometallic species

Student Learning Objectives:

- To learn synthesis and characterization techniques employed in all sub-fields of inorganic chemistry, including solid-state, main-group, coordination, organometallic, and bioinorganic disciplines
- To learn current, practical applications of the theoretical concepts discussed in Inorganic Chemistry lecture (CHEM 530)
- To develop a new laboratory experiment on multinuclear NMR, for use in future incarnations of CHEM 531

Laboratory Safety:

You are expected to adhere to the safety policies outlined in the Chemistry Department's Chemical Hygiene Plan (Section I), available at http://chem.winthrop.edu, highlights of which will be discussed in class. Please alert an instructor promptly when questions or concerns arise.

Preparation:

You are expected to read the week's laboratory experiment and any assigned handouts **prior to pre-lab lecture on Wednesday**. The lecture should supplement your understanding of the material, but is not intended as a substitute for advance preparation.

Attendance:

You are expected to attend all lecture and laboratory sessions in their entirety. If you fail to attend Wednesday's pre-lab or arrive late to the laboratory on Thursday, you may not be permitted to complete that week's work. Please notify an instructor in advance of any planned absences.

Assignments:

Pre-Lab Assignments:
There will be a brief pre-lab assignment for each of the scheduled experiments. These will be due at the beginning of lab on Thursdays.

Lab Reports:
You will be required to turn in some form of culminating assignment (i.e., "lab report") for each experiment; details will be provided in class. In some cases, this will consist of a formal written report, comprising Abstract, Introduction, Experimental Methods, Results, Discussion, Conclusion and References sections. In other instances, it may consist of informal answers to questions.

Assignments must be completed **individually**, even if the laboratory work was performed with a partner or group; the only **exception** to this is the final report for the Multinuclear NMR Project, for which each group will turn in one assignment. Reports are due on the dates indicated on the course schedule or as announced in class. Late reports will be penalized 5% per day.

Development of a New Multinuclear NMR Experiment:
This semester, our class will work from the chemical education literature to refine and test-drive a laboratory exercise involving multinuclear NMR. Student groups will be responsible for preparing a lab write-up styled after a chapter in the textbook; planning, executing and reporting on experiment(s); and making recommendations to improve on the exercise before it is implemented for future incarnations of the course. Specific assignments and deadlines will be provided in class.

Exams:
Two written exams will be given to assess your understanding of the theory and procedures learned throughout the semester. No make-up exams will be given. You must take the final exam in order to pass the course.

Midterm: **Thursday, March 21**
Final: **Wednesday, April 24, 8 a.m.**

Additional Requirements for Graduate Credit:

A student wishing to earn graduate credit for this course must plan, complete, and report on one of the "Independent Study" exercises listed with a textbook experiment that the class is performing this semester. The student must choose and obtain instructors' approval for the selected "Independent Study" exercise no later than **March 1, 2019**. The formal written report on this activity is due no later than **April 22, 2019**, and will be worth up to 100 points.

Grading:

The assignments for this course and their respective point values are shown below.

Pre-lab Assignments	50
Lab Reports, Exp. 1-7	350 (7 x 50)
Multinuclear NMR Project	100
Lab Notebook	50
Midterm Exam	50
Final Exam	100
Total	**700 points**

Course grades will be determined based on the total points earned. The following grading scale is guaranteed; grade cut-offs may be adjusted lower, depending on class performance:

A 93-100	**A-** 90-92	**B+** 87-89	**B** 83-86	**B-** 80-82
C+ 77-79	**C** 73-76	**C-** 70-72	**D** 60-69	**F** <60

Students with Disabilities:

Winthrop University is committed to providing access to education. If you have a condition that may adversely impact your ability to access academics and/or campus life and you require specific accommodations to complete this course, contact the Office of Accessibility (OA) at 323-3290 or accessibility@winthrop.edu. Once you have your official notice of accommodations from OA, please provide it to an instructor as soon as possible.

Academic Integrity:

Any instances of academic misconduct will be dealt with as outlined in the Student Conduct Code, found in the *Student Handbook* (http://www.winthrop.edu/uploadedFiles/studentconduct/StudentHandbook.pdf).

Syllabus Change Policy:

Changes to the policies listed here may be made at the instructors' discretion. You will be notified of any modifications.

Tentative Course Schedule (subject to change):

Dates (Wed. – Thur.)	Experiments Performed (Textbook Experiment #)	Reports Due
Jan. 9-10	**No meetings**	
Jan. 16-17	**1.** The Molecular Sieve Zeolite-X (**#3**)	
Jan. 23-24	**1.** continued; **2.** The 1-2-3 Superconductor $YBa_2Cu_3O_7$ (**#1**)	
Jan. 30-31	**2.** continued	Exp. 1
Feb. 6-7	**3.** Electrolytic Synthesis of $K_2S_2O_8$ (**#9**)	Exp. 2
Feb. 13-14	**4.** Borane-Amine Adduct BH_3:$NH_2C(CH_3)_3$ (**#4**)	Exp. 3
Feb. 20-21	Molecular Modeling	
Feb. 27-28	**5.** Metal-Arene Complex (**#16**)	Exp. 4
Mar. 6-7	**6.** Amino Acid Complexes: $Ni(glycinate)_n^{(2-n)+}$ (**#22**)	Exp. 5
Mar. 13-14	**Spring Break**	
Mar. 20-21	**6.** continued; **Midterm Exam 3/21**	
Mar. 27-28	**7.** The Paramagnetic Complex $Mn(acac)_3$ (**#12**)	Exp. 6
Apr. 3-4	**7.** continued; **8.** Multinuclear NMR Project	
Apr. 10-11	**8.** continued	Exp. 7
Apr. 17-18	**8.** continued	
Apr. 24, 8 a.m.	**Final Exam; Notebooks due**	Exp. 8