

CHEM 531: Inorganic Chemistry Laboratory (Section 001) – 1 credit hour Spring 2022

Course Meetings: Thursdays, 2:00-5:50 PM

Pre-Lab Lecture: Sims 113C – Meet here first, unless instructed otherwise
Laboratory: Sims 310

Instructors:

Dr. Robin Lammi	Dr. Jay Hanna
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Office Hours:

Dr. Lammi: M 1:00-2:00; W 10:00-11:00; and any time you care to stop by. Appointments are also welcome.
Dr. Hanna: M 3:00-4:30; 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.

Attendance:

You are expected to attend all meetings (pre-lab and lab) in their entirety. Please notify an instructor in advance of any planned absences.

Preparation:

You are expected to thoroughly read the week's laboratory experiment and any assigned handouts, and to actively watch any pre-lab videos – take notes! – prior to pre-lab on Thursday.

Assignments:

Pre-Lab Quizzes:

A ~15-minute quiz will be given for each experiment during the pre-lab meeting, testing your preparation for and understanding of the lab to be performed. Quizzes will be open-book and open-notes.

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, Conclusions, 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. No make-up exams will be given. You must take the final exam in order to pass the course.

Midterm: Thursday, March 24

Final: Wednesday, April 27, 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. The student must choose and obtain instructors' approval for the selected "Independent Study" exercise no later than **March 1**. The formal written report on this activity is due no later than **April 25**, and will be worth up to 100 points.

Grading:

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

Pre-lab Quizzes	70 (7 x 10)
Lab Reports, Exp. 1-7	350 (7 x 50)
Multinuclear NMR Project	130
Lab Notebook	50
Midterm Exam	50
<u>Final Exam</u>	<u>100</u>
Total	750 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

COVID-19 Statement:

During this pandemic period, each student is expected to act in the best interest of the WU community by behaving responsibly to limit the spread of the COVID-19 virus. All students, faculty, and staff must wear masks inside buildings and classrooms, unless alone in a private office. All members of the campus community must follow campus guidance on masking. Please do not attend class if you have a fever or any signs of the COVID virus; do not attend class if your roommate or someone you have close contact with acquires the virus; and be respectful of others' desire to remain COVID-free. Students who violate WU guidelines will be asked to

comply. Continued failure to comply may result in referral to the Dean of Students Office as a student conduct violation.

COVID-Related Absence:

Students should contact Health Services regarding a positive test, close contact, or enhanced COVID-like symptoms. Any student who has tested positive, has COVID-like symptoms, or has close contact with someone who has COVID must contact Health Services. Students should log in to the Patient Portal to schedule a TELEPHONE TRIAGE Appointment with COVID as the reason and upload the positive test result, if applicable. Health Services will communicate with the student on what steps to take next, and the Dean of Students Office will get absence verification for required isolation and quarantine, if necessary. Students who verify their absences through the Dean of Students Office often minimize any academic impact caused by missed class time. Health Services will only provide dates of absence, not medical information. Please note, residential students who test positive or are close contacts are expected to follow their personal COVID Quarantine and Isolation Plans.

Students with Disabilities:

Winthrop University is committed to providing equal access to education for all students. If you have a disability (e.g., mental health concern, medical condition, learning disability, etc.) and you anticipate or experience academic barriers due to this condition, please contact the Office of Accessibility (OA) at 323-3290 or accessibility@winthrop.edu. Once you receive approval for accommodations through OA, please inform an instructor as soon as possible so that we may implement your accommodations in a timely manner.

Academic Integrity:

Any instances of academic misconduct will be dealt with as outlined in the Student Conduct Code, found in the *Student Handbook* (<https://www.winthrop.edu/studentconduct/winthrop-university-student-handbook.aspx>).

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):

Date	Experiments Performed (Textbook Experiment #)	Reports Due
Jan. 13	Introduction (meet in Sims 113C)	
Jan. 20	1. The Molecular Sieve Zeolite-X (#3)	
Jan. 27	1. continued; 2. The 1-2-3 Superconductor YBa₂Cu₃O₇ (#1)	
Feb. 3	2. continued	Exp. 1
Feb. 10	3. Electrolytic Synthesis of K₂S₂O₈ (#9)	Exp. 2
Feb. 17	4. Borane-Amine Adduct BH₃:NH₂C(CH₃)₃ (#4)	Exp. 3
Feb. 24	4. continued 5. Metal-Arene Complex (#16)	
Mar. 3	5. continued	Exp. 4
Mar. 10	6. Amino Acid Complexes: Ni(glycinate)_n⁽²⁻ⁿ⁾⁺ (#22)	Exp. 5
Mar. 17	Spring Break	
Mar. 24	6. continued; Midterm Exam	
Mar. 31	7. The Paramagnetic Complex Mn(acac)₃ (#12)	Exp. 6
Apr. 7	7. continued; 8. Multinuclear NMR Project	
Apr. 14	8. continued	Exp. 7
Apr. 21	8. continued	
Apr. 27, 8 a.m.	Final Exam; Notebooks due	Exp. 8